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The

BLUE JAY

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FOR SASKATCHEWAN AND ADJACENT REGIONS

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Saskatchewan Museum of Natural History Photo

Bonaparte's Gull at Lamotte's Swamp, north of Cochin, July, 1956

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SNOWMOBILES IN SASKATCHEWAN

In "A new menace to wildlife" (*Blue Jay*, March, 1967) R. D. Symons described the "skidoo" and four years later, in March, 1971, I commented editorially on the harmful effects of the snowmobile. At that time I was concerned about such matters as noise pollution and destruction of habitat brought about by the existence of the vehicle as such. But the letter on page 70 of this issue and a recent personal experience have brought the problem of the use certain individuals make of the machine sharply into focus for me.

On the day of our 1971 Christmas bird count in the area northwest of Regina I actually observed the chase of a red fox in the deep snow of a stubble field. Two snowmobiles continuously chased the fox back and forth, successfully preventing his escape to the brush and woods of Boggy Creek. I could do nothing to stop them though they saw both my car on the road and my repeated gesticulating. Eventually the chase ended but beyond a little knoll so that I could not see what actually took place. Later, when one of the drivers (snowmobile licence #19-454) joined me, I told him that by harassing the fox he had been breaking a law. Surprised, he made light of the affair and implied that his was the normal approach and mine a slightly humorous one.

Many areas in the world are making a positive attempt to meet the ever-increasing threat of the snowmobile. In France, for instance, the snowmobile for personal use has been prohibited (*Leader-Post*, January 13, 1972). In the United States, many areas are restricting the use of snowmobiles in a more rigorous manner than that used in the past (*Newsweek*, January 24, 1972). Closer to home, the Wascana Centre Authority, which until recently had tried to live with the snowmobile and had allowed its use in parts of this rather extensive property, has banned the machine from the area. Obviously, the snowmobile is harming the very habitat the Authority is attempting to maintain and develop.

Unfortunately, the Government of Saskatchewan is apparently reluctant to face the "off-road vehicle" problem. (In this connection, do not forget the ominous fact that not only the snowmobile but also the trail bike, the dune buggy and the four-wheel-drive jeep have become a plague in the United States.) Not only are snowmobiles allowed in our provincial parks but their presence in the parks is enthusiastically encouraged. The DNR *Resource Report* (5:46, February 10, 1971) describes all the power toboggan trails and trailside shelters currently under construction in provincial parks at Cypress Hills, Belanger Creek, Battleford, Pike Lake, Goodspirit, Moose Mountain, Duck Mountain, Echo Valley, Blackstrap and Buffalo Pound and states that other trails are being planned. The report emphasizes that the trails will open up aesthetic areas of the parks which in the summer are inaccessible by car. There is no suggestion that use of snowmobiles in parks will be limited to the designated trails and there is no evidence that the government is more prepared to enforce its legislation against harassment of wildlife in park areas any more than it is in the environs of Boggy Creek. Admittedly, the legislation is difficult to enforce but with proper equipment it could be done. (Certainly, the fines must be very much heavier, e.g. a minimum of $1000 instead of a maximum of $100.)

Now, the government's recent announcement that municipalities may apply for permits to hunt foxes and coyotes from snowmobiles when there is evidence of predation and over-population of these animals also suggests that the government not only condones the killing of animals from motorized vehicles but that it had little intention in the first place of trying to enforce its legislation against the harassment of wildlife by snowmobiles.

If you are concerned, as all natural history people must be, you should write to the government demanding that it examine its policy regarding the use of snowmobiles. Send a copy of your letter to the *Blue Jay* editor.

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POPULATION AND OUR NATURAL ENVIRONMENT

by **David H. Sheppard,** Biology Department, University of Saskatchewan, Regina

There are too many people in the world. Most Canadians do not really grasp the enormity of the problem, despite the frequent dissemination of information by television and the press. Such people should examine a copy of "*Readings in Human Population Ecology*" published by Prentice-Hall (Englewood Cliffs, New Jersey) and edited by Wayne H. Davis, an ecologist at the University of Kentucky. This comprehensive collection of articles will provide any reader with a thorough knowledge of the human population problem. Actually, the collection covers a group of problems all related to overpopulation, including present world population, predictions of population growth, world food supply, zero population growth, social attitudes toward birth control, the quality of life, vanishing resources, economic growth, abortion, family planning, and others. A variety of viewpoints is presented. The gloomy, but inescapable conclusion one reaches in reading the collection is that many, probably most, of the underdeveloped nations will never attain a standard of living comparable to that of North America because of an overabundance of people and a shortage of resources. Let us, however, consider the situation in terms of Canada itself.

The Canadian Population Problem

Canadians, even many of those who do regard world overpopulation as a serious problem, do not believe that the problem has anything directly to do with Canada. We have a large country and a small population. We are said to have vast natural resources and we tell ourselves that the future belongs to Canada. Yet we have 500,000 unemployed, half of whom are young people. To these frustrated unemployed, the country is already overpopulated in that there are too many people competing for too few opportunities. Yet, for many this aberration is only the temporary result of faulty economics and will shortly be reversed.

Even if we accept the premise that Canada can and should support further population growth, this does not mean that there is no population problem. Our present population is about 21 million and has more than doubled since the 1931 census. Until very recently, our population was increasing at about 2% per year (Ehrlich and Ehrlich, 1970). During the last few years the growth rate has declined and may be as low as 1% per year, which is the present U.S. rate. At a rate of increase of 1% per year, the population will double again by 2040, within the lifetime of many of our children. At 2% per year it will double by 2005. Most of this growth will occur in southern Canada and the water, minerals, forests, and other resources of the north will be exploited and diverted to sustain it. Basically, southern Canada has indicated that it is fully prepared to follow the American pattern of high economic and low environmental priorities, despite the increasingly obvious fact that this approach has not led Americans to a life of quality and social well-being. Parts of southern Canada are already overcrowded. For example, few westerners would wish to live in Toronto or Montreal because of excessive population densities and associated problems such as pollution. Canada as a whole may be underdeveloped but certain areas are, according to the tastes of many Canadians, decidedly overpopulated.

Because Canada still has a relatively low overall population, the problem of population control is not so urgent as that faced by our neighbour to the south. Even if the United States were to adopt a policy based on replacement (birth rate equal to death rate) and allow an average of two children per couple (zero population growth), their population would still increase to about 300 million before stabilizing. Thus, in order to halt population growth at a particular level, it is necessary to plan at least 30 years in advance and if the decrease in births depends upon public acceptance of government population plans, an even longer interval would be necessary.

How Many People Should Canada Have?

In Canada there is urgency to decide upon and adopt a long range population goal, preferably one that will perpetuate a Canadian natural environment of great variety and high quality. We have not yet asked ourselves the question, "How many people should Canada have?" Until we agree on the importance of this question, there will be no serious population, economic, or environmental planning in this country and any plans that are made will inevitably be ignored as the population expands.

How many people should Canada have? Developers, industrialists, real estate companies, businessmen, and governments (in fact, most of us) have a vested interest in growth, including population growth. In reply to the question, they are apt to say, "As many as possible." A minority of Canadians might espouse a different view. For example, a trapper in northern Saskatchewan might say, "There are too many people now." Such views as the latter are usually ignored because they run counter to the accepted definition of progress. Is it progress to destroy the natural environment in order to create jobs and thereby increase spending? Surely a better view of progress would give primary consideration to the long term life of the country rather than to short term exploitation.

How many people should Canada have? The question might be given a different emphasis by asking, "What is the optimum population for Canada?" By "optimum" is meant that number at which a maximum number of the population will have access to a fulfilling life, a life with the greatest possible opportunity, health, and happiness in an environment that is stimulating, esthetically pleasing, and as diverse and interesting as possible. A population that surpasses this hypothetical optimum does so at the expense of one or more of these elements.

The optimum population (Figure 1) can not be exactly determined but it should be possible to make a series of estimates using different measurements of environmental quality. For example, one might attempt to estimate the area of National Parks required to sustain various population levels. The estimates would necessitate assumptions about the amount of crowding that can be permitted without impairing the enjoyment of park visitors and spoiling the wilderness aspect of the parks. An estimate of optimum population could then be made based on an assumed level of environmental quality in National Parks. The desired level of environmental quality can be estimated from public opinion surveys, as well as studies of human impact on natural environments. In this case, the optimum population for the country will depend on how many square miles of National Park land we are willing to

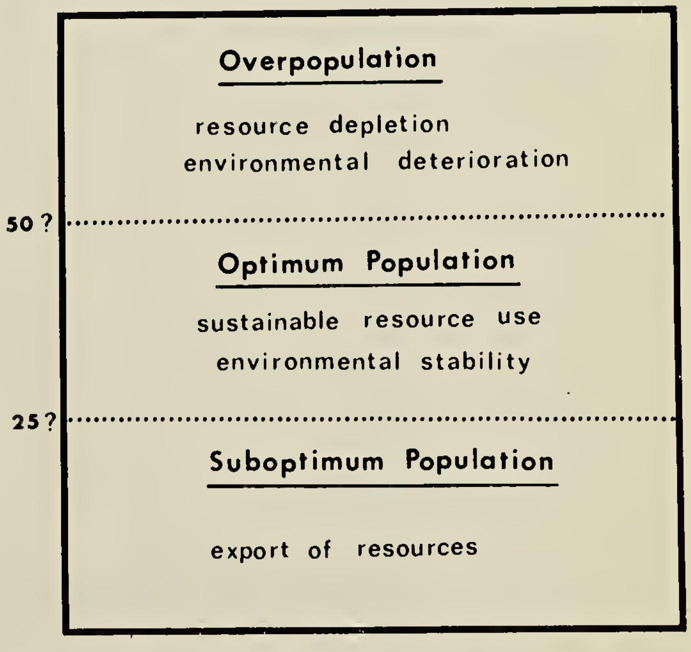

Fig. 1 The optimum population for Canada. The range 25 to 50 million is merely a guess. Sophisticated estimates of optimum population will require large scale public opinion surveys, scientific studies, and computer analysis.

set aside. In a similar way, other estimates can be made based on hunting, fishing, boating, hiking, wilderness travel, wildlife preservation, and so on, each affording a separate estimate of the optimum population. The final estimate of the optimum population must then consider all potential uses of the natural environment. Obviously, the problem soon becomes exceedingly complex.

Governments have made no attempt to estimate population optima. To do so will require placing primary value on environmental quality as opposed to environmental exploitation and valuing the quality of life above the Gross National Product. There is some basis for optimism in the return of some young people to a simple, self-sufficient, agrarian way of life. It may reflect a new respect for the natural environment and in time could spread to the population in general (Reich, 1970).

Outdoor Recreation—The Key to Determining Optimum Population

If the explosive growth in demand for outdoor recreation indicates anything, it indicates a need by man for contact with nature. This need, I believe, should dictate a definition of environmental quality, and consequently provide the key to determining Canada's optimum population. We must try to estimate how many parks, lakes, rivers, and wilderness areas we will need in the future to satisfy the demand of Canadians for contact with nature. Furthermore, this estimate, when arrived at, can only be an approximation and therefore it behooves us to reserve too much wilderness rather than too little.

Any estimate of our future natural area requirements must be based on low density use. It is not satisfactory to subject park users to crowded beaches, tent cities, and noisy weekend

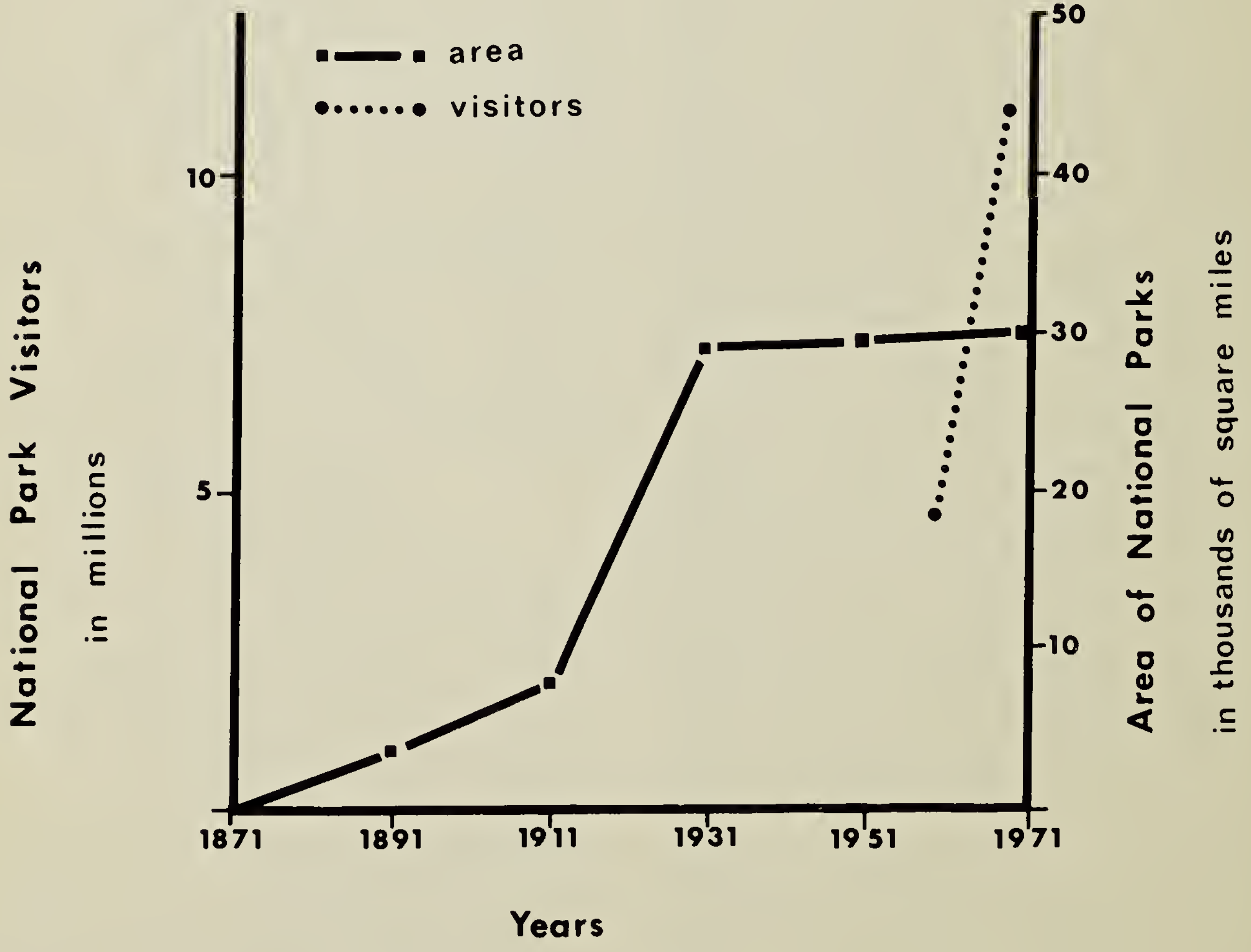

Fig. 2 Canada's National Parks. Growth in area (1871-1971) and number of visitors (1960-1968, earlier data unavailable). Use of the parks has increased sharply in recent years but park expansion has not kept pace. (Data from Canada Yearbook).

parties. Such conditions do not fulfill the need for a natural environment of high quality and lead only to frustration and disappointment.

In my opinion, we have greatly underestimated the amount of park and natural lands needed to provide for our recreation needs. Any visit to Banff National Park in July and August will attest to the overcrowding in that park. Since 1931 very little area has been added to the National Park System and since 1960 park visitations have increased at a remarkable rate (Figure 2). These two related facts have already caused considerable deterioration in the quality of our mountain parks. Any reversal of this deterioration must depend either on restricting the number of visitors to the parks or on creating new parks or both.

What kind of Environment do Canadians Want?

Estimating the optimum population for Canada will not be easy. The components of the analysis depend on a thorough study of the attitudes of Canadians toward their environment. What do Canadians regard as an environment of high quality? As an example of a more specific question, an attitude survey might ask, "Do most Canadians live in cities because they prefer them or because their jobs necessitate their doing so?" The development of suburbs, the preference for large acreages rather than small lots, and the mass exodus of city dwellers to the country in the summer all suggest that the environmental quality of our cities leaves something to be desired. At present, many urban Canadians cannot afford a summer cottage, or even a vacation. The just society of the future should allow everyone that possibility and reserve high quality natural environments for that purpose.

The ultimate definition of environmental quality, arrived at by planners, must not be a simple-minded evaluation based on majority opinion. Rather, their goal should be to satisfy all needs for outdoor recreation, as well as to conserve natural environments for the future. If, for example, surveys show that the majority of Canadians require only picnic tables on weekends for outdoor recreation, this does not justify the complete elimination of wild country. A valid assessment of attitudes toward environmental quality should aim at maximizing the variety and diversity available in our environment. It should provide the greatest possible variety of choices in outdoor recreation. Fortunately, nature has done an admirable job in creating diversity. Our job is to maintain it.

Long Range Planning is Required

Estimating and attaining the optimum population for Canada will require immediate commitments by federal, provincial, and local governments to long range planning. In Canada, at present, we have no long range plans for most of our natural environment just as we have no long range economic plans and no long range plans for resource utilization and population growth. The best minds in the country should be tackling these difficult problems with an integrated approach (because the problems are interdependent). As citizens we must pressure governments to initiate planning studies. As spokesmen for Canadian wilderness we must persuade governments to surround essential areas of wilderness with firm legal boundaries to prevent exploitation and environmental damage. Governments must specify those rivers that will be free of dams and pollution for all time, those areas that will be free of roads forever, those caribou herds which are to be preserved along with their traditional migration routes, those salmon populations to be maintained, and so on. It seems to me that Canadians want a future filled with more than beer, traffic congestion, acid rock, and television football. If not, there is little hope even for that natural part of Canada which still survives.

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A CONSERVATION PROJECT ON BIG GULLY CREEK

by **Christine Pike,** Waseca

Perhaps the Indian people had a name for it, but the white man came to call the long valley 'Big Gully'. Rising in the Streamstown area of Alberta, the Big Gully Creek winds east in its ancient bed in the bottom of the valley to enter the North Saskatchewan River northeast of the Saskatchewan town of Maidstone.

The entire length of the creek offers much that is of interest, but it is the area around the mouth of the creek that local people are most anxious to protect. Here are steep wedges of hills, covered by birch, spruce, mountain alder, highbush cranberry, and aspen. On the southern uplands are the intriguing, seemingly misplaced, spruce swamps.

In the river, across from the creek mouth, lies Pine Island, site of five fur-trading posts built in the late 1700's. Stirring events occurred here in days gone by, and the Big Gully country has much colorful history and folklore.

Among the early white settlers in this locality were the Fosters of United Empire Loyalist descent, who arrived in 1902. Frank Dryden Foster so loved the unique beauty of the mouth of the Gully that he requested to be buried there. His grave, on his own land, overlooks the river and the island. It was in 1926, with the late historian Campbell Innes, that Foster had explored the ruins of the trading posts on the island, which is now under government protection, and where, in 1966, some archaeological studies were made.

One of the spruce swamps is on Foster land and some members of the family try to protect it as Frank Dryden Foster did. They also leased the land immediately around the creek mouth from the Municipality owning it. In the early 1950's, local people tried to have this land set aside as a protected area. Unfortunately, their efforts were unsuccessful.

Big Gully was part of my childhood, and the childhood of many others. It was to me a supreme adventure to take the long, winding south-side trail through the sandhills to the mouth of the Gully. I remember well the excitement of that first glimpse of the spruce swamps; the waving grass on the then unfenced plateau, and, at last, spread out below us, the North Saskatchewan River with its fascinating islands!

After I grew up, I would take my nieces to camp there, sometimes making the 60-mile round trip with horses. Cool nights, the thin wail of the coyote, does with their fawns, an unseasonable blizzard, a transient antelope, carpets of violets — they all became a grand kaleidoscope of memories.

But, in 1967, the Fosters lost the lease to a newcomer to the district.

On the long May weekend of 1970, we followed the winding old wagon trail, and again saw the tops of the swamp spruce peeking over the hills. We again saw the long rolling stretch of open country that made you feel as though, just maybe, a buffalo could still be over the next rise. Yes, it was all still there. We set up our usual careful little camp, feeling ourselves a part of the past. That feeling was

The first cabin built at the swamps by Frank Dryden Foster.

short-lived. Next morning one of the girls walked down to the creek on a path that winds through spruce, came back and said, "There's been a bulldozer down there."

There had indeed. My unspoken foreboding had been justified. For about one-quarter of a mile on the sandy creek banks, a broad strip of spruce, birch, aspen and cranberry trees had been destroyed. The machine had been used to shove up, not one, but two temporary crossings, which naturally had washed out. An aimless track of destruction went up the old Indian Crossing trail. A grove of water birch had been smashed, and, if not for a "drift fence", the bulldozer would have gone right through where we were now camped, and down the peaceful path through the spruce. It all seemed so devoid of reason. Next day, across the creek, we saw more damage. We met the local Scout leaders there and they expressed the same dismay.

I had contacted the Natural History Society, on whose behalf Dr. Stuart Houston came on May 24th to visit Big Gully. He offered the Society's help in purchasing the land at the mouth of the creek so that it could be protected as a natural area. Dr. Stan Rowe and his biologists from the Saskatoon campus studied the area in June, in connection with the survey of Natural Areas for the International Biological Program.

Local people were contacted, letters written and 'phone calls made. Our M.L.A., the members of our local municipal council, the Wildlife Federation, the Maidstone Riding Club, a women's club, farmers, teachers and students were interested. The North Battleford radio station gave us excellent publicity, while the weekly Maidstone newspaper printed letters and articles.

Jim Wedgwood and Dr. Houston, along with a Maidstone high school teacher, the reeve of our Municipality, and myself, attended a council meeting of the Municipality owning the land. Though they gave us an attentive hearing and assured us the damage to the land had taken place without their permission, they did not wish to sell the land at that time. In May 1971, the 600 acres was put up for tender. We made an offer on behalf of the Natural History Society and obtained the lease for $390.00 per year, for a three-year period. Local people proved their interest by donating enough money for this purpose.

North Saskatchewan River and Pine Island.

Even if the financial support is given to renew the lease in the years to come, various factors indicate that constant vigilance is necessary. Our own area is not without its mindless element. Also, oil wells could be placed on the property, ending the tranquility, further obliterating traces of our storied past, and destroying any hope of a wildlife sanctuary.

We still have hopes that the government will see fit to preserve the area. At an August, 1971, meeting of the N.D.P. party in Cutknife constituency, a high school student moved a resolution that the land at the mouth of Big Gully Creek be protected. This motion carried and the local M.L.A. once more promised to help all he could.

How sad it would be if all our efforts, which are touched on only very briefly here, should end in failure. It seems that almost every month another beautiful place disappears, or a pioneer trail is plowed under, never to be replaced, never again to provide an experience for the eye, the mind and the heart.

AN EARLY PROVINCIAL MUSEUM FIELD CAMP IN THE BATTLEFORD AREA

by **Margaret Belcher,** 2601 Winnipeg Street, Regina

In June, 1972 the Saskatchewan Natural History Society will hold its annual field meet in the vicinity of North Battleford and the Battlefords' Provincial Park. Thirty-five years ago the bird life of a part of this area was studied during a six-week period by Fred G. Bard at a field camp established at Cochin by the Provincial Museum (now the Saskatchewan Museum of Natural History). Since then, there have been only occasional reports of the bird life of the Battleford area, and this is now regarded as one of the most neglected corners of Saskatchewan with regard to bird records. An area farther north, from Meadow Lake to Flotten Lake, was studied from July 21 to September 6, 1948 by W. Earl Godfrey's party from the National Museum of Canada (Godfrey, 1950), but this area lies well beyond the Cochin field camp site and, with its mixed-wood forests, represents an ecologically different situation. Some records of observations made in the Battleford area in the 1950's were kept by Spencer G. Sealy when he was a high-school student, and in recent years, a few short trips have been made to the original Cochin study site by Fred Bard and Fred W. Lahrman of the Saskatchewan Museum of Natural History to check the current status of certain colonial bird species. Wayne and Don Renaud spent two and one-half days at the north end of Jackfish Lake June 3-5, 1970, investigating the bird life of the marshes and shoreline.

Mary Houston and I paid a short visit to the Battleford area in 1963 to examine the field-trip possibilities and the availability of accommodation for a future SNHS field meet. We spent the morning of July 27 birding in the provincial park and vicinity, and concluded that it was a good site for a summer meeting. It was then that I approached Fred Bard for further information about his 1935 bird study. He kindly loaned me the bird records that he had copied from his personal diary, and these supplemented the information about Bard's study given in the annual report of the Director of the Provincial Museum (Dunk, 1936).

According to Dunk, the 1935 Museum field camp was located "twenty-four miles north of North Battleford near Jackfish Lake, along the creek which connects Murray and Jackfish Lakes." From the observations recorded, it appears that the district worked from the camp extended south from Cochin to the junction of the Battle and North Saskatchewan rivers, and 20 miles north of Cochin to Glaslyn. The present Highway No. 4, running south from Glaslyn to North Battleford and crossing the river to Battleford, may therefore be thought of as the axis of the study area, with the camp at Cochin as its focal point (Figure 1).

Lying just below the northern limit of the transition zone, in rolling aspen parkland, this area was recommended as a field camp site by Robert D. Symons, then a field officer of the Department of Natural Resources stationed at Meota. Symons was struck by the occurrence of certain species of birds regarded at that time as rare in Saskatchewan, and by the generally rich wildlife of this varied habitat with its lakes, streams and excellent marshes. One of the most productive of the marshes referred to in Bard's field notes was "Lamotte's Swamp", ten miles north of the Battlefords' Provincial Park. This was a swamp on crown land leased to M. Lamotte, whose ranch was close by, and it was later gazetted as a bird sanctuary through the efforts of Fred Bard and Bob Symons, and given the title "Marais des oiseaux" as a compliment to the French-Canadian settlers of the area. Unfortunately protection is no longer accorded this valuable marsh.

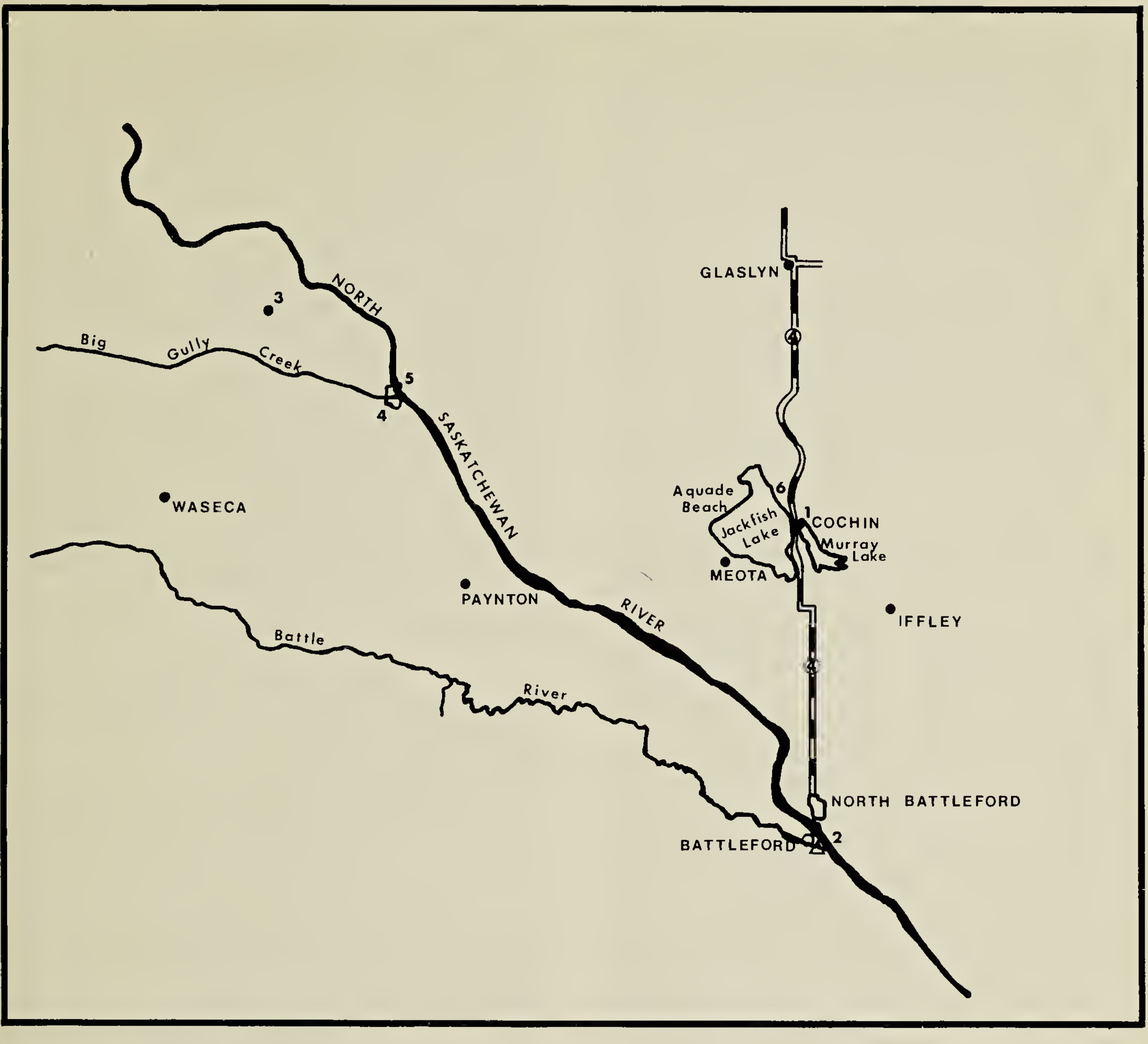

Fig. 1 Map of the Battleford area, showing location of the 1935 Museum field camp at Cochin, and other points of interest that may be visited during the SNHS meeting June 9-11, 1972. 1. Provincial Museum field camp at Cochin, 1935. 2. Fort Battleford National Historic Park. 3. Gus Kenderdine monument on the original Kenderdine farm. 4. Big Gully Creek Conservation Project. 5. Pine Island (site of old fort). 6. The Battlefords' Provincial Park.

It appears that the Museum party was in the field from May 15 to around June 25. Fred Bard was the only member of the Museum staff assigned to the study, for those were the lean years of the 1930's when the government treasury was as empty as private purses. Bard was, however, a young and enthusiastic naturalist who had already gained considerable experience in the field. He was accompanied by two unpaid companions — his father, who was unemployed at that time, and Fred Bradshaw, who had just left the Provincial Museum. The daily living allowance of $1.35 was stretched to provide three meals a day for three men, with more than an occasional meal-time visit from the DNR field officer. Yet, according to Fred Bard, they ate well, for his father always had the camp fire burning and tea ready when the men returned from the field, and a few casts of his fishing line at the creek's mouth never failed to produce fresh fish for the table. The fish were mostly pike, delicious when freshly caught and cooked over the fire, and they were enjoyed every day, along with the luxury of fresh air, sunshine and bird song. Nor did the men fail to recognize their good fortune, for as they shared the frugal camp fare, they would often see the caravans of impoverished farmers from drought-stricken southern Saskatchewan moving northward in search of new homes.

Many specimens were taken in 1935, since collecting was a primary function of the field camp. These now form part of the collection of study skins, nests and eggs in the Saskatchewan Museum of Natural History or have been used in preparing exhibits. Specimens were not always recorded in Bard's field notes, but there are accession records for them in the Saskatchewan Museum of Natural History. Bard's principal purpose in keeping a log book was to note things of special interest, to establish what species were in the area, and to be able to draw conclusions about the breeding status of birds whose nesting range was then unknown. Thus no attempt was made to keep a complete daily list of all birds seen, or to see as many birds as possible each day. Moreover field trips were usually made on foot, owing to the limited gasoline allowance for the car, and no suitable boat was provided for exploration of the lakes. These factors restricted the amount of ground that could be covered daily, as well as the total number of areas that could be visited. So a common resident species like Brewer's Blackbird might not be seen at all for some days, and then seen in numbers on a day when a farmstead was visited. At the camp site at the mouth of the creek surprisingly few migrant waders were seen, although many kinds of shorebirds move through Saskatchewan in the last two weeks of May, but only an occasional visit could be paid to the more suitable shoreline of Jackfish Lake near Meota where Fred Bard does recall seeing many waders. It is apparent to anyone now familiar with the birds of central western Saskatchewan that certain species that might have been seen in the area in 1935, as well as others like the Starling that were not present then, do not appear in Bard's list.

The birds recorded by Fred Bard during the camp period are listed below in the Species List in A.O.U. Check-List order. Information about them comes from Bard's notes, from Dunk's report as Museum Director (1936), and from Godfrey (1950) to whom Fred Bard furnished a list of specimens collected by him at Cochin. In the case of unusual records, supplementary data have been added for previous and subsequent sightings in the area. Birds believed by Bard to be resident species in the area in 1935 (either on the basis of nests found, or of the presence of birds in numbers, and singing, during the breeding period) are indicated in the list by an asterisk. Additional species established later by other observers as breeding in the area are included in the list in small type.

SPECIES LIST

***Red-necked Grebe.** A few seen May 18, 27, and June 1.

***Horned Grebe.** Three pairs seen May 21, one male June 3 and one female June 4. Two sets of four eggs collected June 10.

*Eared Grebe. Noted as breeding in the Battleford area (Spencer Sealy, pers. comm., August 8, 1963). Colony of seven nests in marsh at north end of Jackfish Lake noted by Wayne and Don Renaud July 4, 1970 — one nest with five eggs, four nests witth three eggs, two nests with two eggs.

***Western Grebe.** A few seen May 19, 21, 24, 27 and June 2, 10. A pair remained near camp in early June. At the mouth of the creek, 22 were seen June 19, 20, fishing as late as 10:00 p.m., and a number of these were banded.

***Pied-billed Grebe.** A few seen May 18, becoming common May 23, 24, 25. Again, a few seen May 27 and June 2. A pair noted near camp.

White Pelican. Seven seen May 19 and two May 25, June 9.

Black-crowned Night Heron. Two immatures seen June 1.

***American Bittern.** One seen May 19, two May 21, a few May 25, one June 3, and a few on June 10.

Whistling Swan. One at Jackfish Narrows, June 9.

Canada Goose. One at mouth of the Battle River, June 7.

***Mallard.** Nests with four and nine eggs May 19, one nest May 21. On June 3, broods of eight and 10 young were seen, and on June 10 a nest with young.

***Gadwall.** A few seen May 18, June 3 and 10.

***Pintail.** Two nests with five and nine eggs, May 21. Broods of two and nine June 3. Nest with young, June 10.

***Blue-winged Teal.** A few seen May 18, 21, becoming common May 24, 25. A few noted May 27, more common June 2, a few June 10. Nest with eight eggs June 19.

Cinnamon Teal. One male seen on Murray Lake marsh near Cochin (date not given).

***American Widgeon.** Recorded as breeding (no dates given).

***Shoveler.** Nest with nine eggs May 19, two nests with seven and nine eggs May 21, a few seen June 3, nest with 10 eggs June 9, common June 10.

***Redhead.** One seen May 25, 26, a few June 3, common June 10.

***Canvasback.** Common May 19.

***Lesser Scaup.** Very common May 21, a few seen May 27, common June 10.

Bufflehead. Two collected May 21, one male collected May 25.

[*Sealy (pers. comm. January 19, 1972) observed the species breeding near Battleford.]

***Ruddy Duck.** A few seen May 19, June 1, 3. Nest with eight eggs June 9.

Red-breasted Merganser. One female seen May 23, two females June 4.

***Turkey Vulture.** Nesting pair on island south of Murray Lake in 1933 (Symons, 1967).

***Red-tailed Hawk.** Seen May 18, 21. Nest June 6.

***Swainson's Hawk.** On May 19, Bard "saw male with 8 crows and Red-tail standing around." Seen May 21, June 3, 6, 10.

***Marsh Hawk.** Nest with five eggs at Lamotte's ranch May 21. One female seen May 26. Nests with 4, 4, 5 eggs June 3.

***Sharp-tailed Grouse.** Two seen May 21, one June 6.

***Chukar.** Nesting in wild conditions at farm of Mental Hospital, Battleford.

***Gray Partridge.** Common May 21, 22, one pair seen May 24, 25, a few May 27, June 2. Nest with 19 eggs June 12, nest with 16 eggs June 14, brood of approximately 20 young June 17. Largest clutch—24 eggs in nest at Battleford on farm of Mental Hospital.

***Sandhill Crane.** One see May 19, two May 21. Tracks seen June 3. One rufous-coloured bird June 10. Three years before (1932), R. D. Symons had found what he believes was the last Sandhill Crane nest with eggs at Lamotte's Swamp.

***Sora.** A few seen May 21, common May 25 (one collected), a few June 10. Nest with 10 eggs June 20.

***Yellow Rail.** Bard's field notes record a number May 19, a few May 21, rails heard again June 3, and a few June 10. Dunk's report (1936) adds that "a number of slough bottoms where the birds had been heard were dragged over with ropes and nets, but every effort to flush them proved fruitless. Mr. Symons had taken a specimen from this locality after flushing it in this manner." Symons' specimen was collected July 6, 1934 on the Nelson Flats three miles east of Battleford (Bradshaw, 1935; Godfrey, 1950; Symons, 1956, 1967). This was the first specimen in the Provincial Museum, although two previous specimens had been taken elsewhere in Saskatchewan (Houston, 1969). Neither Symons nor Bard was able to locate a nest, although the birds were evidently breeding.

***American Coot.** Adult with seven or more young on creek, and nest with one addled egg in marsh at north end Jackfish Lake seen by Wayne and Don Renaud July 3, 1970.

***Killdeer.** A few seen May 25, 27, common June 10.

***Common Snipe.** Common May 19. Nest with three eggs, June 3 (Dunk's report notes nest with three eggs collected on this date 24 miles northwest of Cochin.)

***Upland Plover.** Two noted May 19.

***Spotted Sandpiper.** A few seen May 18, one May 22, 24, three May 27, a few June 2, 6.

Photo by Fred W. Lahrman

Franklin's Gull at Murray Lake, May 29, 1952.

*__Willet.__ Common May 20, 21. Five seen June 3.

Lesser Yellowlegs. Two seen June 11.

*__Marbled Godwit.__ A few seen May 18, 19, 25, six June 3, a few June 7, 10.

*__Wilson's Phalarope.__ Common May 22, three May 25, 14 June 2. Four nests June 3, with two sets of eggs collected (Godfrey, 1950). Common June 10.

Herring Gull. Two immature males taken at Jackfish Lake, June 17 (Dunk, 1936; Godfrey, 1950). Bard's field notes give date as June 18.

California Gull. Recorded (no date given). Gulls of this species noted by Mary Houston and the writer July 27, 1963.

Ring-billed Gull. A few noted May 27. [*Sealy (pers. comm. January 19, 1972) observed a breeding colony in 1968 on Jackfish Lake.]

*__Franklin's Gull.__ Very common May 19, 20, 21, 27, June 10. Bard recalls "hours" of these gulls drifting by the camp in long, undulating strings—out in the morning, back at night. According to Dunk, the nesting site of a "very large colony of Franklin's Gulls, estimated to contain fifty thousand birds" was visited June 24 on Murray Lake near Cochin. Some of the nests had just been completed; others contained from one to five eggs. Adults, chicks, and nests were collected. This colony was re-visited on May 29-30, 1952 by Fred Bard and Fred Lahrman, who estimated that 25,000 Franklin's Gulls were nesting there. Several years later, however, they were no longer nesting on Murray Lake. Wayne and Don Renaud found a nesting colony, estimated to contain over 200 pairs, in the marsh at the north end of Jackfish Lake, July 4, 1970. These were probably birds from the earlier Murray Lake colony, as Franklin's Gulls seem to move about unpredictably.

*__Bonaparte's Gull.__ Five seen May 19, four May 20. Two nests with three eggs in each found June 3 (Godfrey, 1950, records that one of the nests and three eggs were collected). A few seen June 10. Dunk (1936) notes that Bard visited one nest again June 20 when the last of three young were hatching, and materials were collected for a marsh habitat group (the "Lamotte's Swamp Group—Glaslyn" at SMNH).

This is the breeding locality described by R. D. Symons in *Hours and the birds* (1967) and in his account in The *Blue Jay* of the "Atypical nesting of Bonaparte's Gull in Saskatchewan" (1968). The first breeding record for Saskatchewan was established by Symons in May, 1932. On May 31, 1933 Symons collected a female bird and took the nest and three eggs for the Provincial Museum.

Bard checked the colony in Lamotte's Swamp again in 1955 and 1956 (Bard, 1956). In July, 1955 he saw one young Bonaparte's Gull flying with adults south of the swamp, and in 1956 he saw five adults and found one nest with three eggs. On June 7, 1969 (not June 17 as erroneously reported in the *Blue Jay*) Fred W. Lahrman and Lorne Scott of the Saskatchewan Museum of Natural History visited the swamp and found a nest with three eggs. The screaming pair above the nest were joined by a third bird, possibly one of of a second breeding pair, but the gulls were "fewer in numbers than in previous years" (Lahrman, 1969). On June 28, 1970 Lahrman and Scott spent one-half hour at the swamp, and noted a single Bonaparte's Gull aggressively defending territory. No nests were found, but one young Bonaparte's Gull (possibly a week old) was found dead (Lorne Scott, pers. comm. January 18, 1972).

***Forster's Tern**: Birds were reported by Bard May 21 (3?), May 23 (one taken), May 24 (3), May 25 (5), May 30 (4), June 2 (3), June 4 (3), June 10 (heard), June 11.

Dunk (1936) cites Bard's account of the trip made June 11 with R. D. Symons to the marsh south of Murray Lake to seek the nesting site of these terns: "On our arrival at the marsh several were seen in flight, two of which suddenly dropped into the tule reeds. As we paddled towards the spot two Forster's and one Black Tern took flight from a floating mass of old marsh reeds, about fifteen feet long and two feet in width. As we approached two single eggs were seen. Having brought the canoe alongside the reeds, two hollows were found, one of which contained two eggs, the other one. These eggs were larger and lighter in color than those of the Black Tern, three of which were found in a well-constructed nest on the opposite side of the floating reeds. On our way out of the marsh another Forster's took flight from the top of an old muskrat house. No eggs or nest was found here.

"Wishing to get a nest of the Forster's Tern with the usual three eggs the marsh was visited again on June 12th, only to find the eggs had probably been destroyed, the crude nests being empty. No broken shells were found. The nest of the Black Tern was found intact.

"We were disappointed at the loss of this our first nesting record. As we were returning, what was evidently a female Forster's Tern was flushed from the muskrat house. Here was found one egg. Photographs were taken, the egg collected and carefully wrapped. One egg from a Black Tern's nest nearby was placed in the 'excuse' for a nest on the rat house. Shortly after the bird was flushed it returned to the nest. On the next visit this egg had disappeared and the nest was deserted. From this was concluded that the Forster's Terns are very timid when laying and if disturbed at this period desert the nest and destroy the eggs, or the eggs may have been destroyed by non-breeding Franklin's Gulls."

When Fred Bard and Fred Lahrman visited Murray Lake on May 29, 1952 they saw several Forster's Terns.

On the basis of Dunk's report, Gerrard and Whitfield (1971) give this locality as one of two breeding localities of the Forster's Tern in this general area. The second locality was a marsh described as 10 miles north of Meota, where three nests were found on June 3, 1959 by Spencer Sealy (F.N.R.S.).

On a brief visit to Cochin in 1961, Fred Bard and Fred Lahrman failed

Photo by Wayne Renaud

Nest and eggs of Forster's Tern at the north end of Jackfish Lake.

to note Forster's Terns. However, on July 3 and 4, 1971 at the location visited by Sealy in 1959, approximately 37 nests were found by Wayne and Don Renaud in a small, marshy bay of Jackfish Lake about three-quarters of a mile south-southwest of Aquadeo Beach. Most of these nests were empty, but some contained eggs or young. The observers searched only a part of what they believed to be the total colony, but judged the number of adult birds present to indicate a colony of between 50 and 100 pairs, which would be one of the largest Forster's Tern colonies in Saskatchewan (Renaud, 1971).

***Common Tern.** Common May 18, 24, few May 27. Bard believed they might be nesting on Jackfish Lake, but had no evidence. However, Sealy found them nesting there in 1960 (pers. comm., January 19, 1972), and on July 13, 1963 Stuart and Mary Houston banded 111 on two little islands in the marshy bay at the south end of Jackfish Lake, while more than 20 young swam away unbanded, and 15 nests were left with eggs. On July 25, 1965, the Houstons banded 21 at the same site, but the colony was not thriving, and they learned locally that the terns had been molested by children throwing stones. (C. Stuart Houston, pers. comm., January 16, 1972).

***Black Tern.** Common May 18, 21, 25, very common May 27, June 3. Nests of two and four eggs, June 9.

***Mourning Dove.** Common May 21, heard May 30, six at Paynton June 6, common June 10.

***Black-billed Cuckoo.** Bard believed it to be breeding. Substantiated by Sealy who has a nest record for Battleford (pers. comm., January 19, 1972).

***Great Horned Owl.** One seen May 22, June 3, 6.

***Long-eared Owl.** One seen May 18.

***Short-eared Owl.** One seen at Lamotte's Swamp May 22, one June 6, 10.

***Common Nighthawk.** One seen May 29, a few June 2, 3, 6, 10.

***Ruby-throated Hummingbird.** One reported flying past camp May 21.

***Yellow-shafted Flicker.** Nesting May 19, 27 (two pairs), one female seen May 29, one male May 30, two males May 31. Nesting (common) June 10.

Photo by Wayne Renaud

Marsh habitat near Aquadeo Beach where Black and Forster's Terns and Franklin's Gulls nest in abundance.

***Yellow-bellied Sapsucker.** One seen May 20.

***Hairy Woodpecker.** One male seen May 19. Nesting May 24.

***Downy Woodpecker.** Breeds near Battleford according to Sealy (pers. comm., January 19, 1972). One pair seen at the park July 27, 1963 (Belcher, Houston). Nest found in poplar tree in the Battlefords' Provincial Park by Fred Lahrman June 7, 1969.

***Eastern Kingbird.** A few seen May 18, 21, 22, becoming common (new migrants) May 24, 26, a few June 2, common June 10.

***Western Kingbird.** Breeding at Battleford 1959 (Sealy, pers. comm., January 19, 1972). Nest with four eggs at Aquadeo Beach, July 3, 1970 (Renaud, pers. comm., January 6, 1972.

***Eastern Phoebe.** Nesting May 29 (two nests, one being built, one with three young and two eggs—under bridges). Nest with four eggs collected at Cochin, June 14; nest with one egg plus one cowbird egg collected at Iffley June 15 (Godfrey, 1950).

***Least Flycatcher.** Three seen May 19, a few May 24, 25, 27, June 2, 6. Two males collected June 6.

***Western Wood Pewee.** Heard June 18.

***Tree Swallow.** Common May 18, 24, 25, a few May 27, common June 1, a few June 2, 3, common June 10.

***Bank Swallow.** Colony of about 50 burrows noted July 3, 1970 in bank of North Saskatchewan River south of Battleford by Wayne and Don Renaud.

***Barn Swallow.** Seen May 21, a few June 3, common June 10.

***Purple Martin.** Several pairs noted north of Jackfish Lake and one nest with three half-grown young found under an eave July 4, 1970 by Wayne and Ron Renaud (pers. comm., January 16, 1972).

***Black-billed Magpie.** Common near Battleford when Sealy arrived there in 1958 (pers. comm., January 19, 1972).

***Common Crow.** Two nests with three and five eggs May 21, two with three and five eggs May 25, common May 25, nest with young May 31, nest June 10 (when Bard noted, "few have young, season late.")

***Black-capped Chickadee.** Two seen May 25, one June 1, nest with young June 11.

***House Wren.** A few May 19-25, becoming common June 3, 10.

***Long-billed Marsh Wren.** A few seen May 19, 24, 25, June 3, common June 9, 10. At Murray Lake nearly 100 nests (many of course unoccupied) were found on May 29, 1952 by Fred Bard and Fred Lahrman; two nests were collected that had seven eggs each. Many nests were again found on Murray Lake on Bard's visit in 1961, and three nests were found July 3-4, 1970 by Wayne and Don Renaud at the north end of Jackfish Lake (pers. comm., January 16, 1972).

***Short-billed Marsh Wren.** Heard June 1. A few seen June 10.

***Catbird.** No dates given, but Bard commented on varied repertory of imitative calls.

***Brown Thrasher.** A few seen May 21, 24, 27, June 2. Nest with four eggs June 9.

***Robin.** Nest with three eggs May 19. Common May 27, June 10.

***Veery.** A few noted May 21, 24, 25, 27, June 3.

***Mountain Bluebird.** Nesting May 21.

***Sprague's Pipit.** A few noted May 19, June 3; becoming common June 7, 10. Dunk's comment (1936) is of interest: "This bird of the prairie has evidently extended its range to the wooded country north of Battleford. They were seen twenty-four miles northwest of Cochin in May, 1935. This being their nesting time, they probably breed here."

***Cedar Waxwing.** A few heard May 30, June 1, 2, 4; becoming common June 9, 10.

***Loggerhead Shrike.** Common May 18, one seen May 25, a few June 3, common June 10.

***Starling.** Adults seen with food by woodpecker hole July 3, 1970 by Wayne and Don Renaud (pers. comm., January 19. 1972). Have been present since Sealy arrived in Battleford in 1958 (pers. comm., January 19, 1972).

***Red-eyed Vireo.** One seen May 29, heard June 4. One male collected June 6. A few noted June 10.

Philadelphia Vireo. Migrant. One seen at Cochin June 9. Dunk (1936) commented "uncommon in the province". Bard's notes described song as "two-syllabled, quite like Red-eyed."

***Warbling Vireo.** One seen May 28, a few June 10.

***Tennessee Warbler.** Common May 19, a few noted May 25, 27, June 1. Nest with two warbler eggs and two cowbird eggs June 15, reported by Dunk (1936) and Godfrey (1950) as collected.

***Yellow Warbler.** Common May 19, 20, 21, 25, June 2, 3. Nest with four eggs June 6; a destroyed nest June 9.

Myrtle Warbler. Common May 19, one seen May 25, common May 28.

Blackpoll Warbler. First migrants: common May 19, a few May 24, 25, 27.

American Redstart. One male seen May 29, June 2. One noted June 6. [*Sealy records it as breeding near Battleford (pers. comm., January 19, 1972).]

***House Sparrow.** Noted as common breeding species from Sealy's arrival in 1958 (pers. comm., January 19, 1972).

***Bobolink.** One male collected in the vicinity of Battleford May 21. Three seen May 22; heard June 3; a few noted June 10.

***Western Meadowlark.** Common when listed June 10.

***Yellow-headed Blackbird.** Common May 19, 20, 21, 24, 25; very common June 1; common June 10. Common June 16-22 (two nests with two and four eggs, two nests with one and four young).

***Red-winged Blackbird.** Nesting May 25. Common May 27. Two nests with one and four eggs June 3, nesting June 10.

***Baltimore Oriole.** One male seen May 18, common May 22, females seen May 25, common May 27 and very common June 2. Nest near camp June 9.

***Brewer's Blackbird.** Common when recorded June 14.

***Common Grackle.** One male collected May 23. A few seen May 27. Five banded June 3. Common June 10.

***Brown-headed Cowbird.** A few seen May 18, becoming common May 24, 27. A few seen June 3.

***Rose-breasted Grosbeak.** One male seen May 21. Heard June 2. A few noted June 6. Heard June 9. No nest found, but males were singing and assumed breeding.

Pine Siskin. Five seen May 18.

***American Goldfinch.** Several heard and seen July 3-5, 1970 by Wayne and Don Renaud (pers. comm., January 16, 1972). Also seen July 27, 1963 (Belcher, Houston). Assumed by the author to be breeding.

***Rufous-sided Towhee.** Three noted along North Saskatchewan River at Battleford June 12, 1971 by Wayne and Don Renaud (pers. comm., January 16, 1972). Assumed by the author to be breeding.

***Savannah Sparrow.** A few seen May 19, June 1, 2, 3; becoming common June 10.

*****Baird's Sparrow.** Dunk (1936) noted, "The northward movement of prairie birds is again apparent from the number of Baird's Sparrows in the vicinity of Battleford, June, 1935. Evidently they were breeding here."

*****Leconte's Sparrow.** A few seen May 19, 21; two June 1; a few June 3, and common June 10.

*****Sharp-tailed Sparrow.** A few seen May 19, 24, 25, June 3; common June 10.

*****Vesper Sparrow.** A few May 19, becoming common May 20, 21, 26. A few June 3, common June 10.

*****Lark Sparrow.** Breeding near Battleford, 1959 and 1960 (Sealy, pers. comm., January 19, 1972).

Tree Sparrow. Common May 27.

*****Chipping Sparrow.** Common May 19, a few May 24-26.

*****Clay-colored Sparrow.** Common May 18, 21, 24, 25, 27.

Harris' Sparrow. Heard May 15, one seen May 19.

White - throated Sparrow. Common May 19, 21. One seen May 24. Heard singing June 12, 19 (possibly breeding, but no definite evidence.) Reported by Godfrey (1950) as breeding at Flotten Lake, and "noted south to Glaslyn." Fred Bard and Fred Lahrman tape-recorded a White-throated Sparrow's song on May 22, 1956 near Lamotte's Swamp.

*****Lincoln's Sparrow.** A few seen May 19. Nest with four young June 20 [*sic*]. Dunk (1936) gives date as June 10, "first nesting record for the province." Adult female collected June 20 (Godfrey, 1950) at Tamoths [*sic*]. Since no such place name exists, "Tamoths" may be a misprint for Lamotte's (i.e. Lamotte's Swamp).

*****Swamp Sparrow.** A few seen May 19, 21. Heard June 3. Common June 10. Breeding.

*****Song Sparrow.** Common May 19, 25, 27, June 10.

McCown's Longspur. One seen June 3.

Acknowledgments

I am grateful to Fred G. Bard for lending me some years ago his 1935 bird records from the Provincial Museum camp at Cochin, and for taking time recently (just before leaving Regina for the winter) to tell me more about the camp activities.

I also wish to acknowledge the useful information given me by Robert D. Symons, who spent considerable time in the study area when he was stationed there as a DNR field officer and accompanied Bard on a number of field trips. Further information about breeding species was helpfully supplied by Fred W. Lahrman, Lorne Scott, C. Stuart Houston, Spencer G. Sealy and Wayne and Don Renaud. Critical comments on the manuscript were made by Robert W. Nero.

I hope that the renewed interest taken in the Battleford area this year, with the SNHS summer meeting being held there, will lead to the publication of a bird list for the locality.

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THIRTIETH ANNUAL SASKATCHEWAN CHRISTMAS BIRD COUNT, 1971

Compiled by **Mary Houston,** 863 University Drive, Saskatoon

Thirty-eight counts were sent in from Saskatchewan localities, and one from the Northwest Territories for the Christmas Bird Census for 1971. Only once, in 1968, did we have as many as 38 localities represented from the province.

A total of 58 species seen on count days, plus 4 additional species seen during count period, was compiled. No new species were added this year to the all time list (which includes 114 plus 6 additionals).

The most exciting reports were the 2 Gyrfalcons seen — one at Harris and the other at Saskatoon. Only once previously, has a Gyrfalcon been reported, when Don Buckle saw one at Lady Lake in 1963. One of the unexpected results of our Saskatchewan Christmas counts has been the establishment of the Pigeon Hawk as a regular winter resident; this year they were reported from a record of nine localities (seven on count day). This was also a major year for the Snowy Owl, reported from 16 localities (13 on count day).

There have been no other major trends apparent in species numbers, except that Pine Grosbeaks, so scarce last year in all regions, have returned to their usual numbers, and Redpolls also low in numbers last year are more numerous than usual this year.

Most interesting and encouraging was the number of young people who arranged counts in their home or neighboring areas.

ABERDEEN - SMUTS, Jan. 2; 46 miles by car in 3 hours; temp. 4°; scattered cloud; wind NW 20 mph; drifting snow; 7 species, 965 individuals. Gray Partridge, 8; Snowy Owl, 1; Black-billed Magpie, 20; Bohemian Waxwing, 12; House Sparrow, 185; Common Redpoll, 90; Snow Bunting, 649.—Dr. and Mrs. J. B. Gollop.

BIGGAR, Dec. 30; 50 miles by car in 1¼ hours and 3 miles on foot in 2½ hours; temp. 8°; sunny, clouding over in mid-afternoon; wind 0-10 mph; 11 inches of snow cover; 13 species, 568 individuals. Pigeon Hawk, 1; Sharp-tailed Grouse, 3; Rock Dove, 3; Downy Woodpecker, 1; Black-billed Magpie, 12; Black-capped Chickadee, 2; Bohemian Waxwing, 192; House Sparrow, 227; Evening Grosbeak, 4; Pine Grosbeak, 1; Common Redpoll, 6; White-winged Crossbill, 2; Snow Bunting, 114. (Add: Great Horned Owl, 1, Dec. 18; Snowy Owl, 1, Dec. 24 and 28; Rusty Blackbird, 1, Dec. 27).—Annie, Don, Harvey and Wayne Renaud.

BLAINE LAKE, Dec. 31; 3 miles by snowmobile and on foot in 2½ hours; temp. 20-25°; wind W 20 mph; partial cloud; 1 foot of snow; 7 species, 69 individuals. Hairy Woodpecker, 2; Black-billed Magpie, 8; Black-capped Chickadee, 3; House Sparrow, 40; Evening Grosbeak, 2; Pine Grosbeak, 1; Common Redpoll, 13. (Add: Gray Partridge, 6; Snow Bunting, 8).—Ernest Kardash.

BORDEN, Dec. 28; 68 miles by car and 1 mile on foot in 7 hours; temp. 0-15°; cloudy and windy; 13 species, 1558 individuals. Pigeon Hawk, 1; Sharp-tailed Grouse, 40; Gray Partridge, 11; Rock Dove, 15; Snowy Owl, 2; Black-billed Magpie, 30; Black-capped Chickadee, 3; Bohemian Waxwing, 73; House Sparrow, 360; Pine Grosbeak, 22; Hoary Redpoll, 24; Common Redpoll, 321; Snow Bunting, 656.—John and Stanley Shadick.

BROADVIEW, Jan. 1; 75 miles by car and 3 on foot in 6½ hours; temp. 22°; wind W 13 mph; 14 species, 323 individuals. Golden Eagle, 2; Pigeon Hawk, 1; Ruffed Grouse, 5; Ring-necked Pheasant ,1; Rock Dove ,7; Blue Jay ,1; Black-billed Magpie, 20; Black-capped Chickadee, 22; Bohemian Waxwing, 8; House Sparrow, 45; Evening Grosbeak, 17; Pine Grosbeak, 36; Common Redpoll, 88; Snow Bunting, 70. (Add: Sharp-tailed Grouse, 2, Dec. 27; Gray Partridge, 8, Dec. 27; Great Horned Owl, 1, Dec. 25 and 27; Hairy Woodpecker, 1, Dec. 25; Downy Woodpecker, 1, Dec. 21; Horned Lark, 1, Dec. 25; Northern Shrike, 1, Dec. 27).—David Chaskavich, David Weidl.

CARON, Dec. 27; 13 species, 587 individuals. Golden Eagle 1; Sharp-tailed Grouse, 38; Ring-necked Pheasant, 7; Gray Partridge, 25; Snowy Owl 1; Downy Woodpecker, 5; Horned Lark, 28; Black-billed Magpie, 28; Black-capped Chickadee, 1; Bohemian Waxwing, 16; Pine Siskin, 12; Lapland Longspur, 200; Snow Bunting, 225.—Tom Donald, Jim King, Robert Kossatz, Jim Kroshus, Bob McCall, Bob Rafuse (compiler) — members of the Saskatchewan Falconry Association.

DILKE, Jan. 2; 38 miles by car and 2 miles on foot in 3 hours; temp. 2°; sunny becoming overcast; wind NW 10-30 mph; 8″ snow drifted; 9 species, 900 individuals. Sharp-tailed Grouse, 13; Gray Partridge, 31; Rock Dove, 9; Horned Lark, 60; Black-billed Magpie, 24; Bohemian Waxwing, 17; House Sparrow, 156; Common Redpoll, 584; Snow Bunting, 6. (Add: Northern Shrike, 1, Dec. 30).—Boswell Belcher (compiler), Margaret Belcher, Mr. and Mrs. S. R. Belcher.

ELDORADO (Wellington Lake Hydro), Dec. 23; area within half mile of house; temp. –35° to –33°; 5 species, 47 individuals. Hairy Woodpecker, 2; Gray Jay, 2; Common Raven, 2; Black-capped Chickadee, 1; Common Redpoll, 40.—Mrs. E. A. Middleton.

FORT QU'APPELLE, Dec. 28; temp. 7°; clear; 4½ inches of snow; 12 species, 204 individuals. Mallard, 27; Lesser Scaup, 4; Sharp-tailed Grouse, 3; Black-billed Magpie, 3; Black-capped Chickadee, 17; Bohemian Waxwing, 17; Northern Shrike, 1; House Sparrow, 23; Evening Grosbeak, 6; Pine Grosbeak, 38; Common Redpoll, 25; Snow Bunting, 40. (Add: Ruffed Grouse, 1, Dec. 24, 25; Rock Dove, 8, Jan. 2; Downy Woodpecker, 1, Dec. 23; Blue Jay, 4, Dec. 30; Robin, 1, Jan. 1; Common Grackle, 1, Dec. 23; Blackbird (Rusty?), 1, Jan. 1.).—Dr. and Mrs. G. D. Barnett, E. Manley Callin (compiler), Mr. and Mrs. Wm. Gray, Ron Hooper, Jack and Jay Lowe, Dick Nevard, John Norman, Horace Reed, Mr. and Mrs. S. P. Regan, Joe Rumancik.

GRIFFIN, Jan. 1; 12 miles by car in 1½ hours and ½ mile on foot in ¾ hours; temp. 25°; clear; no wind; 6 species, 142 individuals. Rock Dove, 10; Great Horned Owl, 1; Snowy Owl, 1; Bohemian Waxwing, 20; House Sparrow, 4; Unidentified Blackbird, 1; Snow Bunting, 105 (Add: Starling, 1.) — Bruce Naylor.

HARRIS, Dec. 19; 160 miles by car in 13 hours and 15 miles on foot in 10 hours and 6 miles by snowmobile in 1 hour; temp. 8-17°; cloudy in a.m., clear in p.m.; wind NE 0-5 mph; 8 inches of snow; 24 species, 2652 individuals. Marsh Hawk, 1; Gyrfalcon, 1; Sharp-tailed Grouse, 232; Ring-necked Pheasant, 3; Gray Partridge, 96; Rock Dove, 66; Great Horned Owl, 11; Snowy Owl, 10; Short-eared Owl, 1; Hairy Woodpecker, 2; Downy Woodpecker 3; Horned Lark, 2; Black-billed Magpie, 242; Black-capped Chickadee, 19; Bohemian Waxwing, 34; Northern Shrike, 2; House Sparrow, 530; Rusty Blackbird, 2; Pine Grosbeak, 14; Hoary Redpoll, 10; Common Redpoll, 1293; Tree Sparrow, 1; Lapland Longspur, 1; Snow Bunting, 76. (Add: Pigeon Hawk, 1, Dec. 25; Evening Grosbeak, 2, Dec. 23, 24 and 25; White-winged Crossbill, 1, Jan. 1.) — Bernie Gollop, Wayne Harris, Carroll Klein, Annie Renaud, Don Renaud, Wayne Renaud, Bill Richards, Stan Shadick, Jim Wedgwood, Doug Whitfield.

HEPBURN, Dec. 27; 14 miles by car in 1 hour, ½ hour on foot, and about feeding station; temp. –10°; sky clear; light north wind; 7 species, 88 individuals. Gray Partridge, 23; Rock Dove, 10; Horned Lark, 2; Black-billed Magpie, 12; Black-capped Chickadee, 4; Bohemian Waxwing, 2; House Sparrow, 35. (Add: Starling, 5; Common Redpoll, 55; Red Crossbill, 2).—Margaret, Philip, Phyllis and Tena Siemens (Philip Siemens, compiler).

INDIAN HEAD, Jan. 2; 30 miles by car in 1 hour and 3 miles on foot around farm yards and the town in 6 hours; temp. –10 to 0°; wind NW 20-25 mph; cloudy; 8 inches of snow; 21 species, 1184 individuals. Mallard, 20; Prairie Falcon, 1; Pigeon Hawk, 1; Ruffed Grouse, 2; Sharp-tailed Grouse, 17; Gray Partridge, 8; Rock Dove, 28; Hairy Woodpecker, 7; Downy Woodpecker, 14; Horned Lark, 3; Blue Jay, 4; Black-billed Magpie, 33; Black-capped Chickadee, 12; Red-breasted Nuthatch, 2; Bohemian Waxwing, 250; Northern Shrike, 1; Starling, 1; House Sparrow, 250; Evening Grosbeak, 40; Pine Grosbeak, 90; Snow Bunting, 400. (Add: Common Redpoll, 50, Jan. 1.)—Carol Beaulieu, Denise Beaulieu, Ronda Dorwart, Ian Gray, Richard Gray, Mr. and Mrs. Jim Lang, Mrs. Roy McLaughlin, Mr. and Mrs. Fred Nichols, Debbie Reisdorf, Shirley Reisdorf, Mr. Don Sarvis, Brian Scott, Elaine Scott, Lorne Scott (compiler), Mr. and Mrs. Fred Skinner, Mr. and Mrs. Ken Skinner, Mr. and Mrs. Gordon Willerth, Jackie Willerth.

KELVINGTON, Dec. 22; 4 miles by car and around farmyard during day; temp. –8°; wind, SE; light snow in afternoon; 9 species, 40 individuals. Goshawk, 1; Ruffed Grouse, 1; Sharp-tailed Grouse, 12; Hairy Woodpecker, 2; Downy Woodpecker, 2; Black-billed Magpie, 1; Black-capped Chickadee, 8; Evening Grosbeak, 12; Common Redpoll, 1. (Add: Snow Bunting, 22, Dec. 23.)—Dianne Sloan.

KENASTON, Dec. 27; by sleigh, on foot and by car within 1½ miles of yard; temp. –10 to +10°; mostly cloudy; wind NW 10 mph; 8-10" snow cover; 6 species, 2103 individuals. Rock Dove, 12; Black-billed Magpie 12; House Sparrow ,40; Pine Grosbeak, 13; Common Redpoll, 2024; Snow Bunting, 2. (Add: Sharp-tailed Grouse, 8, Jan. 1; Gray Partridge, 14, Jan. 1; Horned Lark, 3, Dec. 29; Black-capped Chickadee, 1, Dec. 30; Northern Shrike, 1, Jan. 1; Slate-colored Junco, 1, Dec. 21.)—P. Lawrence Beckie.

KUTAWAGAN LAKE, Jan. 1; 27 miles by car in 2 hours and 3 miles on foot in 1 hour; temp. 18-24°; sky overcast, gradually clearing; wind SW 9-15 mph; 10 inches of snow; 7 species, 579 individuals. Sharp-tailed Grouse, 14; Rock Dove, 59; Black-billed Magpie, 14; House Sparrow, 77; Hoary Redpoll, 3; Common Redpoll, 405; Snow Bunting, 7. (Add: Golden Eagle, 2, Dec. 30; Snowy Owl, 2, Dec. 28; Horned Lark, 1, Dec. 26.).—Duane Harding, Joyce Harding, Ken Harding, Len Harding, Wayne Harris.

LAFLECHE, Dec. 30; 31 miles by car and on foot; temp. 20°; sunny; 4" snow cover; 9 species, 193 individuals. Ring-necked Pheasant, 5; Gray Partridge, 7; Rock Dove, 7; Snowy Owl, 1; Horned Lark, 100; Black-billed Magpie, 1; Starling, 3; House Sparrow, 50; Common Redpoll, 19. (Add: Golden Eagle, 1, Dec. 26; Mourning Dove, 1, Dec. 22 and 23.)—C. H. Shulver.

LA RONGE, Jan. 2; 5 miles by truck, ½ hour on foot, and also birds observed at feeders around town; temp. 0 to –10°; clear; light wind; 9 species, 103 individuals. Willow Ptarmigan, 8; Sharp-tailed Grouse, 1; Pileated Woodpecker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Gray Jay, 6; Blue Jay, 4; Common Raven, 66; Black-capped Chickadee, 16.—Jeanette Bizaire, Lois Dalby, Mary Friesen, Margaret Siemens (compiler), Mel and Jean Trionak.

LEADER, Jan. 2; 3 hours afield; temp. 24°; snowing lightly and blowing; 1 foot of snow; 4 species, 34 individuals. Sharp-tailed Grouse, 11; Ring-necked Pheasant, 3; Rock Dove, 4; Black-billed Magpie, 16. (Add: House Sparrow, 10, Dec. 22; Western Meadowlark, 1, Dec. 21; Pine Grosbeak, 12, Dec. 30; Snow Bunting, 200, Dec. 22).—Daisy D. Meyers.

LUSELAND, Dec. 29; 40 miles by car in 4 hours and 1 mile on foot in ½ hour; temp. 15°; sunny; 13 species, 364 individuals. Goshawk, 1; Sharp-tailed

Grouse, 9; Gray Partridge, 32; Rock Dove, 70; Snowy Owl, 1; Downy Woodpecker, 1; Horned Lark, 2; Black-billed Magpie, 36; Starling, 1; House Sparrow, 30; Pine Grosbeak, 4; Common Redpoll, 2; Snow Bunting, 150. (Add: Pigeon Hawk 1, Dec. 22; Great Horned Owl, 1, Dec. 22.)—Kerry Finley (compiler), Alan and Bill Holton.

MATADOR, Dec. 19; 132 miles by car and 6 miles on foot; temp. 20 to 25°; clear and calm; 3 inches of snow on the level; 17 species, 803 individuals. Golden Eagle, 2; Sharp-tailed Grouse, 137; Ring-necked Pheasant, 1; Gray Partridge, 30; Rock Dove, 1; Downy Woodpecker, 2; Horned Lark, 3; Black-billed Magpie, 41; Black-capped Chickadee, 4; Robin, 1; Bohemian Waxwing, 137; Starling, 4; House Sparrow, 50; Pine Grosbeak, 25; Hoary Redpoll, 5; Common Redpoll, 338; Snow Bunting, 22.—M. A. Gollop, A. R. Smith.

MOOSE JAW, Dec. 27; 141 miles by car and 7 miles on foot in 7 hours; temp. 5 to 10°; overcast then clearing; calm; slight snow covering on level; 22 species, 3189 individuals. Pigeon Hawk, 1; Sharp-tailed Grouse, 8; Ring-necked Pheasant, 6; Gray Partridge, 48; Rock Dove, 336; Great Horned Owl, 1; Snow Owl, 2; Yellow-shafted Flicker, 1; Downy Woodpecker, 1;Horned Lark, 30; Black-billed Magpie, 73; Black-capped Chickadee, 6; Red-breasted Nuthatch, 1; Bohemian Waxwing, 337; Northern Shrike, 1; Starling, 2; House Sparrow, 950; Western Meadowlark, 1; Pine Grosbeak, 12; Common Redpoll, 759; Slate-colored Junco, 6; Snow Bunting, 607.—Ruth Hilling, Mr. and Mrs. L. Horton, John Horton, Pam and Pat Kern, Leith Knight (compiler), Moray Lewis, Mr. and Mrs. A. W. McAvoy, Dave Robinson, Inez Simmons, Jean Thomson.

NIPAWIN-SQUAW RAPIDS, Dec. 27; 100 miles by car in 5 hours and 4 miles on foot in 2 hours; temp. –10°; snow in the air; wind S 5 mph; 18" snow in bush; 17 species, 3218 individuals. Common Goldeneye, 22; Bald Eagle, 5; Sharp-tailed Grouse, 7; Rock Dove, 3; Snowy Owl, 1; Great Gray Owl, 1; Downy Woodpecker, 1; Blue Jay, 1; Black-billed Magpie, 22; Common Raven, 12; Black-capped Chickadee, 4; Northern Shrike, 1; Starling, 23; House Sparrow, 7; Evening Grosbeak, 35; Common Redpoll, 2013; Snow Bunting, 1060.—Gladys and Stan Riome.

OUTLOOK, Dec. 29; 27 miles by car; temp. –10°; sunny; 6 inches of snow; 5 species, 351 individuals. Gray Partridge, 12; Bohemian Waxwing, 25; House Sparrow, 7; Common Redpoll, 7; Snow Bunting, 300. (Add: Horned Lark, 30, Dec. 25.)—Harold Kvinge.

PIKE LAKE, Dec. 28; 49 miles by car in 9½ hours and 4 miles on foot in 1½ hours; temp. 3–15°; overcast; wind, 10 mph SW to 19 mph NW; 15 species, 629 individuals. Sharp-tailed Grouse, 29; Ring-necked Pheasant, 1; Rock Dove, 17; Hairy Woodpecker, 4; Downy Woodpecker, 8; Blue Jay, 10; Black-billed Magpie, 57; Black-capped Chickadee, 50; Bohemian Waxwing, 140; House Sparrow, 36; Evening Grosbeak, 13; Pine Grosbeak, 8; Hoary Redpoll, 4; Common Redpoll, 97; Snow Bunting, 55.—Dr. and Mrs. J. B. Gollop, F. L. Waite, J. A. Wedgwood.

RAYMORE, Dec. 26; 64 miles by car in 3½ hours and 9 miles on foot in 4 hours; temp. –36° to –24°; clear; wind W 0-6 mph; 14 inches of snow; 12 species, 888 individuals. Sharp-tailed Grouse, 7; Gray Partridge, 8; Rock Dove, 34; Horned Lark, 4; Black-billed Magpie, 17; Black-capped Chickadee, 15; Northern Shrike, 1; House Sparrow, 208; Hoary Redpoll, 2; Common Redpoll, 539; White-winged Crossbill, 2; Snow Bunting, 51. (Add: Ruffed Grouse, 1, Dec. 27 and 3, Dec. 28; Greater Prairie Chicken X Sharp-tailed Grouse, 1, Dec. 24; Ring-necked Pheasant, 4, Dec. 21; Great Horned Owl, 1, Dec. 28 and 3, Dec. 31; Saw-whet Owl, 1, Dec. 28; Hairy Woodpecker, 3, Dec. 27 and 1, Dec. 30 and 31; Downy Woodpecker, 1, Dec. 27; Pine Grosbeak, 11, Dec. 28.).—Harold Eggleton, Duane Harding, Joyce Harding, Ken Harding, Len Harding, Charles Harris, Greta Harris, Les Harris, Vic Harris, Wayne C. Harris (compiler).

REGINA, Dec. 27; 432 miles by car in 27 hours and 56 miles on foot in 26 hours; temp. –12° to 9°; wind W 5-15 mph; overcast; 5" snow; 33 species, 5587 individuals. Mute Swan, 5; Whistling Swan, 4; Canada Goose, 325; Mallard 441; Pintail, 2; Redhead, 1; Canvasback, 3; Lesser Scaup, 15; Ruddy Duck, 2; Prairie Falcon, 1; Pigeon Hawk, 1; Ring-necked Pheasant, 1; Gray Partridge, 21; American Coot, 3; Rock Dove, 371; Great Horned Owl, 3; Snowy Owl, 10; Short-eared Owl, 5; Downy Woodpecker, 2; Horned Lark, 5; Black-billed Magpie, 76; Black-capped Chickadee, 12; Red-breasted Nuthatch, 4; Brown Creeper, 1; Bohemian Waxwing, 283; Cedar Waxwing, 4; Starling, 16; House Sparrow, 1666; Rusty Blackbird, 1; Pine Grosbeak, 95; Common Redpoll, 735; White-winged Crossbill, 15; Snow Bunting, 1454.—Gary Anweiler, Jessie Bailey, Margaret Belcher, Al Binnie, Barbara Binnie, Dr. D. P. Blatler, Tom Burns, Eric Cooke, Gord Daum, Bryn Davies, Wayne Gemmell, Bill Gilmour, Doug Gilroy, Janie Hamill, Mr. and Mrs. Henry, Jim Hines, J. Jordan, J. R. Jowsey, Shirley Jowsey, Larry Kerwin, G. F. Ledingham, John MacDonald (compiler), Joe Miller, Connie Pratt, Shirley Reisdorf, Maureen Rever, J. K. Roberts, Lorne Scott, Carol Spencer, John Spencer, Elisabeth Wagner, Jeanie Wagner, Mrs. E. Wilhelm, Janie Wilhelm.

SASKATOON, Dec. 27; 262 miles by car in 38 hours and 21 miles on foot in 17 hours; temp. –8° to +7°; clear; wind SW 5-10 mph; 12 inches snow; 30 species, 8525 individuals. Mallard, 40; Lesser Scaup, 6; Common Goldeneye, 33; Goshawk, 2; Gyrfalcon, 1; Pigeon Hawk, 2; Ruffed Grouse, 1; Sharp-tailed Grouse, 117; Ring-necked Pheasant, 9; Gray Partridge, 87; Rock Dove, 1846; Snowy Owl, 3; Short-eared Owl, 1; Hairy Woodpecker, 2; Downy Woodpecker, 2; Blue Jay, 14; Black-billed Magpie, 283; Black-capped Chickadee, 100; Red-breasted Nuthatch, 8; Bohemian Waxwing, 2543; Cedar Waxwing, 2; Northern Shrike, 3; Starling, 2; House Sparrow, 1187; Evening Grosbeak, 6; Pine Grosbeak, 95; Hoary Redpoll, 33; Common Redpoll, 1655; White-winged Crossbill, 17; Snow Bunting, 425.—Rod Bantjes, Bob, Jeff and Joan Besant, Pern Cordery, Ron Cruickshank, Marie Gillespie, J. B. and M. F. Gollop, Scott Hale, Dr. C. J. Houston, Mary Houston, Dave and Don Houston, Grev Jones, Joanne McRobbie, Arnold Nijesen, Lynn Oliphant, Wayne Olson, Rick Riewe, John and Stan Shadick, Alan R. Smith, Peter Tassie, Jim and Shirley Wedgwood, Nayda Veeman, Doug Whitfield (Saskatoon Natural History Society and Saskatoon Junior Natural History Society).

SKULL CREEK, Dec. 26; 3½ miles by car and on foot around creek and feed lot; temp. –6°; wind light; 14 species, 3012 individuals. Goshawk, 1; Sharp-tailed Grouse, 15; Ring-necked Pheasant, 22; Gray Partridge, 8; Hairy Woodpecker, 2; Downy Woodpecker, 1; Horned Lark, 107; Black-billed Magpie, 17; Black-capped Chickadee, 22; Bohemian Waxwing, 70; House Sparrow, 60; Western Meadowlark, 3; Common Redpoll, 83; Snow Bunting, 2601. (Add: Pine Grosbeak, 2.).—Jim Bennetto, Austin Drever, Betty and Robert Mann, Marjorie Mann (compiler), Lyle Wagner.

SORENSON BEACH, LAST MOUNTAIN LAKE, Jan. 1; 3 miles in 2½ hours on foot; temp. 20°; wind NW 15 mph; 10-12 inches of snow; 8 species, 115 individuals. Ruffed Grouse, 3; Great Horned Owl, 1; Horned Lark, 2; Black-billed Magpie, 3; Black-capped Chickadee, 22; House Sparrow, 16; Pine Grosbeak, 11; Common Redpoll, 57.—Dr. K. H. Ficke, Hanna Ueberschar, K. H. Ueberschar (compiler).

SPIRIT LAKE, Dec. 30; 55 miles by car in 4 hours and 2 miles on foot in 2 hours; temp. –17° to +7°; clear with fog patches until noon; wind light; 10-12 inches of snow; 12 species, 392 individuals. Goshawk, 1; Ruffed Grouse, 2; Sharp-tailed Grouse, 26; Rock Dove, 7; Great Horned Owl, 1; Hairy Woodpecker, 4; Downy Woodpecker, 6; Black-billed Magpie, 15; Black-capped

Chickadee, 25; House Sparrow, 61; Pine Grosbeak, 19; Snow Bunting, 225. (Add: Evening Grosbeak, 4, Dec. 24; Common Redpoll, 35, Dec. 28.).—Bill and Joyce Anaka, Mrs. Gunn.

SPRING VALLEY, Dec. 27; 4 hours on foot and by car; temp. 5°; wind 10-15 mph; overcast; light snow; 11 species, 782 individuals. Sharp-tailed Grouse, 24; Gray Partridge, 95; Rock Dove, 18; Great Horned Owl, 4; Horned Lark, 30; Black-billed Magpie, 13; House Sparrow, 300; Western Meadowlark, 1; Pine Grosbeak, 1; Common Redpoll, 44; Snow Bunting, 252. (Add: Golden Eagle, 1; Snowy Owl, 1, Dec. 22.).—Allan Bogdan, Nick Bogdan, Mrs. Nick Bogdan (compiler), Ken Elder, Wilbert and Gilbertha Liebelt, Larry and Marie Wiggins and Michael.

STONY RAPIDS, Dec. 31; area of Stony Rapids and Black Lake; temp. 18°; wind calm; clear; 30″ snow; 6 species, 81 individuals. Willow Ptarmigan, 32; Snowy Owl, 1; Gray Jay, 2; Common Raven, 13; Hoary Redpoll, 2; Common Redpoll, 31. (Add: Goshawk, 1, Dec. 26; Great Horned Owl, 1, Dec. 30; Boreal Chickadee, 3, Jan. 1.)—Richard and Donna Sanderson.

WASECA, Dec. 30; 1½ hours on foot; temp. 10°; light east wind; overcast; 5 species, 6 individuals. Ruffed Grouse, 1; Blue Jay, 1; Black-billed Magpie, 2; Black-capped Chickadee, 1; Northern Shrike, 1. (Add: Sharp-tailed Grouse, 1, Dec. 21; Gray Partridge, 12, Dec. 28; Hairy Woodpecker, 1, Dec. 28; Downy Woodpecker, 1, Dec. 22; Boreal Chickadee, 1, Dec. 22; Bohemian Waxwing, 20, Dec. 28; House Sparrow, 14, Jan. 2; Evening Grosbeak, 18, Dec. 29; Pine Grosbeak, 9, Jan. 2; Common Redpoll, 2, Dec. 29; Snow Bunting, 100, Dec. 21.)—Sheila Lamont, Tommy Lamont, Dawn Marchand, Christine Pike (compiler).

WAUCHOPE, Dec. 28; 29 miles by car in 3 hours and 4 miles on foot in 2½ hours; temp. 0 - 12°; wind W 15 mph; 5½″ snow; 10 species, 264 individuals. Sharp-tailed Grouse, 9; Rock Dove, 38; Great Horned Owl, 1; Hairy Woodpecker, 2; Black-billed Magpie, 5; Black-capped Chickadee, 6; Starling, 1; House Sparrow, 72; Pine Grosbeak, 7; Snow Bunting, 123. (Add: Downy Woodpecker, 1, Dec. 24; Northern Shrike, 1, Dec. 27; Common Redpoll, 7, Dec. 30.).—Dale Hjertaas.

WHITE BEAR, Dec. 27; 2 miles by car and 3½ miles on foot in Saskatchewan River breaks; temp. 0°; wind calm; 8-10 inches of snow; 9 species, 98 individuals. Prairie Falcon, 1; Sharp-tailed Grouse, 1; Great Horned Owl, 1; Snowy Owl, 1; Horned Lark, 16; Black-billed Magpie, 50; Bohemian Waxwing, 22; Common Redpoll, 2; Snow Bunting, 4.—George Akister, Glen Cates, Oran Cates, Leroy Clark, David Gunn, Douglas Gunn, Gary Jordheim, Laine Jordheim, S. O. Jordheim (compiler). Members of the White Bear Conservation Club.

WOLSELEY, Dec. 28; 45 miles by car; temp. 10°; clear; calm; 6″ snow; 7 species, 761 individuals. Ruffed Grouse, 2; Black-billed Magpie, 3; Black-capped Chickadee, 2; House Sparrow, 200; Pine Grosbeak, 4; Common Redpoll, 150; Snow Bunting, 400. (Add: Gray Partridge, 9, Dec. 24; Hairy Woodpecker, 1, Dec. 24.)—Brian Hayward, Donald Hayward.

YORKTON, Dec. 26; 60 miles by car and 3-4 miles on foot in 4 hours; temp. -32°; wind NW 10 mph; 4 inches of snow; 7 species, 53 individuals. Sharp-tailed Grouse, 12; Hairy Woodpecker, 1; Downy Woodpecker, 1; Black-billed Magpie, 4; Black-capped Chickadee, 4; House Sparrow, 26; Pine Grosbeak, 5. —Keith Monette, Willie Popowich (compiler), Brian Procyshen.

FORT SMITH, N.W.T., Dec. 30; 45 miles by car in 3 hours; temp. 5°; light overcast; calm; 2 feet of snow; 4 species, 69 individuals. Willow Ptarmigan, 4; Rock Dove, 17; Common Raven, 38; Hoary Redpoll, 10. (Add: Spruce Grouse, 1, Dec. 27; Ruffed Grouse, 1, Dec. 27; Gray Jay, 1, Dec. 29; Boreal Chickadee, 1, Dec. 27; Pine Grosbeak, 14, Dec. 29.) — Ernie and Pamela Kuyt.

RECENT SASKATCHEWAN BANDING OF THE WHITE PELICAN

by **C. Stuart Houston,** 863 University Drive, Saskatoon

The White Pelican *(Pelecanus erythrorhynchos)* has been banded in numbers almost equal to those of the Double-crested Cormorant in Saskatchewan, but a lower recovery rate has resulted in only half the number of recoveries. The pelican recoveries of earlier Saskatchewan banders have been previously mapped (Houston, 1967, 1968, 1970), apart from a small number banded at Quill Lake in 1939 by A D. Gresham and A. Haak of Winnipeg.

The accompanying maps show the recoveries of all remaining Saskatchewan banding through 1964, all of it done by the writer. This cutoff date was chosen as 1964, since the pelican is a relatively long-lived bird, with recoveries received fairly regularly up to about seven years of age. These results are summarized in Table 1. Xerox copies of original banding schedules of Patrick, and Lyon and McArthur, kindly supplied by the banding office at Patuxent, have allowed the original approximate figures to be corrected.

As previously reported (Houston, 1970) one of Bard's pelicans appears to hold the world longevity record for banded birds of this species. A flightless young banded 378-00930 near Imperial Beach on July 9, 1948, was found October 12, 1960 at Dry Lake, South Dakota (44° 30′ N., 97° 00′ W.). The finder, Mr. Andrew Russman of Big Stone City, replied recently to confirm that the bird had been found on the date he had reported it, but added that it had not died of starvation as reported on the computer printout, but was found dead, after having been shot by someone else a day or two earlier—some 12 years and three months after banding.

Two other notable longevity records resulted from banding of young pelicans at Redberry Lake by Lyon and McArthur on July 7, 1937. Band No. 378-03735 was "taken from a pelican on the banks of the Mississippi River" at Baton Rouge, Louisiana on January 15, 1948 by J. P. Longue; the bird was identifiable and so presumably freshly dead, some 10 years and six months after banding. Band No. 378-10769 was taken from a "dead pelican" by J. G. Grace of Ouachita, Arkansas (33° 50′ N., 92° 40′ W.) and was reported in a letter dated October 6, 1951. This was well over 14 years after banding, but since the date of finding was not given, the longevity aspect of this remains unconfirmed.

Pelicans from Redberry, Quill and Last Mountain lakes and probably those from Dore Lake, appear to follow the same flyway; south and slightly east through the Dakotas to Texas, Louisiana and Arkansas. Many of the pelicans from Old Wives and Crane lakes followed the same course, but a few travelled much farther west to western Montana, Wyoming and Utah. Three of the Crane Lake pelicans, banded by me in company with the late Steve A. Mann, likely took the western pathway, since they wintered along the Pacific shore of Mexico; one of them reached Libertad, El Salvador, the record distance for a Saskatchewan pelican. In fact, it is farther south than any recoveries reported from pelicans banded at Yellowstone Park or Great Salt Lake, though both of these populations typically winter along the western coast of Mexico (Behle, 1958; Diem and Condon, 1967).

Unlike the cormorants, there has been little change in the pelican migration routes over a 35 year period, except that the Redberry Lake pelicans in recent years seem to have dispersed more widely at the northern and southern edges of their range. There have been six recoveries, all of birds more than two years of age, from Alberta. There have been proportionately more recoveries from Mexico, in comparison

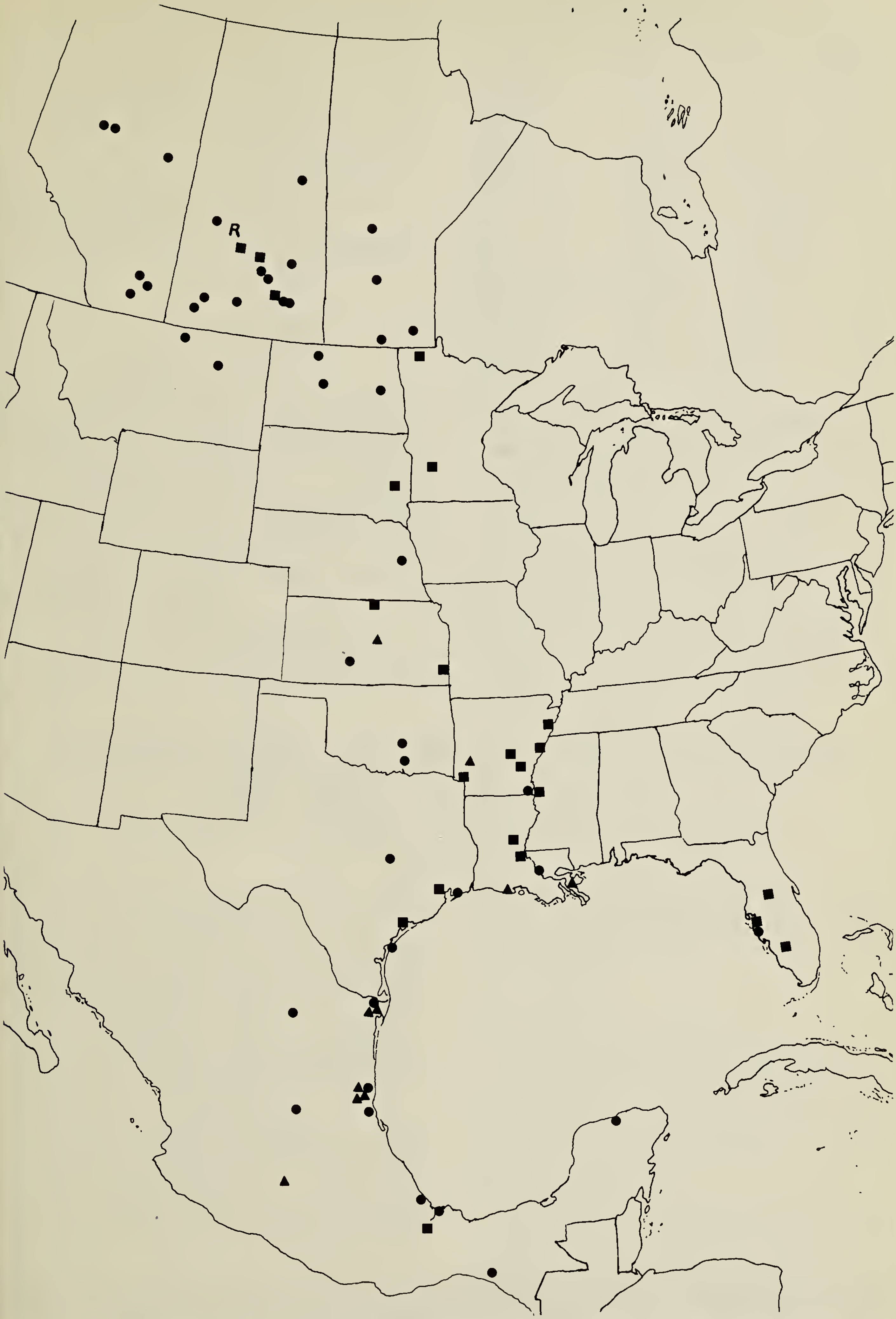

Fig. 1 Recoveries of White Pelicans banded at Redberry Lake (R) by C. S. Houston, 1955-1964. Note: squares represent direct recoveries (same year); triangles, January 1 to June 30 of following year; circles, more than one year old.

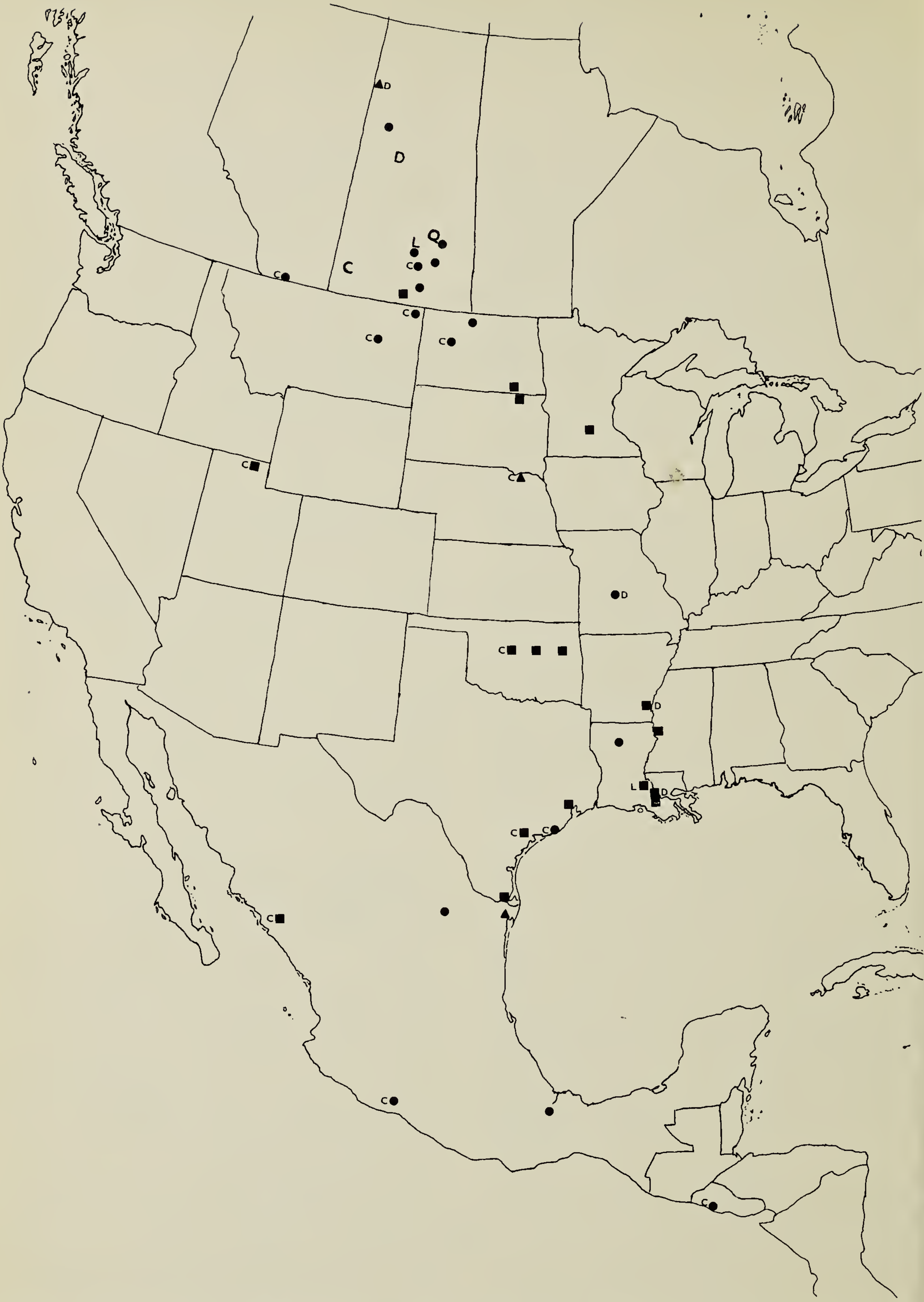

Fig. 2 Recoveries of White Pelicans banded by C. S. Houston at Last Mountain Lake (L), 1954; at Dore Lake (D), 1956; at Quill Lake (Q) 1956-58 and at Crane Lake (C) 1960-61. A letter beside each recovery indicates the lake of origin; those with no letter are from Quill Lake. Squares represent direct recoveries (same year); triangles, January 1 to June 30 of following year; circles, more than one year old.

Table 1. Recoveries of Saskatchewan-banded White Pelicans.

Bander	Lake	Years	Banded	Recov.	% Recov.
J. A. M. Patrick	Quill	1930-32	985	71	7.2%
Fred G. Bard	Quill	1931-37	325	34	10.5%
"	Last Mountain	1948	41	1	2.4%
"	Old Wives	1958	591	44	7.4%
Lyon & McArthur	Redberry	1936-37	328	36	11.0%
Gresham & Haak	Quill	1939	21	3	14.3%
C. S. Houston	Last Mountain	1954	15	1	6.7%
"	Dore	1956	70	4	5.7%
"	Quill	1956-58	395	20	5.1%
"	Crane	1960-61	130	13	10.0%
"	Redberry	1955-64	1258	82	6.5%
		Totals:	4159	309	7.4%

with previous years. This may indicate an increased reporting of birds found by citizens of Mexico, or wider dispersal of the birds, or both, but recent recoveries now give a complete coverage of the gulf shore from Florida all the way around the eastern coast of Mexico to Yucatan.

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WINTER WREN, SPRAGUE'S PIPIT AND OTHER RECORDS AT CHURCHILL

By **Richard A. Forster,** Massachusetts Audubon Society
Lincoln, Massachusetts 01773

Summary accounts of Churchill birds by Jehl and Smith have recently been made available (*Birds of the Churchill region, Manitoba.* Manitoba Museum of Man & Nature, Spec. Publ. No. 1, Winnipeg, 1970). Since their publication appeared, some significant records obtained by R. Pittaway and others were published in the June 1971 *Blue Jay* (29:60-63).

A few observations made at Churchill in 1971 by members of a Massachusetts Audubon Society tour and myself, including first reports of Winter Wren and Sprague's Pipit, seem worth recording.

Harlequin Duck
Histrionicus histrionicus

A drake was observed at Cape Merry on the evening of June 25, 1971.

This is the second record for the area, a male having been seen from July 11 to July 14, 1970 at the same place by Pittaway and I. Newton (*Blue Jay*, 29:60).

Yellow Rail
Coturnicops noveboracensis

Heard calling at Landing Lake on June 24, 1971 and subsequently. This matches the first date of their occurrence recorded by Pittaway in 1970 (*Blue Jay*, 29:60).

Great Yellowlegs *Tringa melanoleuca*

Seven were found at the Goose Creek Road on June 23, 1971. The species was considered "accidental in spring" by Jehl and Smith (1970:40).

Ring-billed Gull *Larus delawarensis*

A single bird was seen several times at the Fort Churchill dump from June 21-25, 1971.

Sighted on three previous occasions, June 14, 1968 (one) (Jehl and Smith, 1970: 51), June 19, 1970 (three) and July 2, 1970 (one) (*Blue Jay*, 29:62).

Cliff Swallow
Petrochelidon pyrrhononta

One was observed flying along the Goose Creek Road on June 23, 1971.

One previous record, a bird sighted on June 11, 1970 by Pittaway and J. Rosenband (*Blue Jay* 29: 63).

Winter Wren *Troglodytes troglodytes*

The distinctive song of this species was heard near the beginning of the Goose Creek Road on June 23, 1971, but it was too windy to record its voice.

An accidental visitor. No previous records are known for the Churchill area. The nearest breeding range according to Godfrey (*The birds of Canada*. Natl. Mus. Can. Bull. 203, 1966) is far to the south in the forested region of southern Manitoba; however, strays have been found as far north as southern Yukon and southern Mackenzie.

Sprague's Pipit *Anthus spragueii*

A male in flight song was seen in the tundra area below the Northern Lights Observatory on June 24, 1971. Its flight song was recorded on tape.

An accidental visitor from the southern prairies — not previously reported for the Churchill region.

Northern Shrike *Lanius excubitor*

A nest with three young was found at the Rocket Range on June 23, 1971.

Jehl and Smith (1970: 65) considered it a "rare summer resident in varying numbers" though fairly common in some years.

FIELD OBSERVATIONS OF POSSIBLE TRUMPETER SWANS NEAR SASKATOON

by **J. B. Gollop,** Canadian Wildlife Service, Saskatoon

On August 29, 1971, I saw a swan on the west side of Goose Lake, about 40 miles southwest of Saskatoon. The bird was studied in full sun for more than 10 minutes until 4:10 p.m. with a 25 x 60 Balscope at a distance of 250-300 yards. The swan spent most of the time preening; it looked around for several minutes and walked about 25 feet before swimming slowly away. The bird was in adult plumage and had a solid black bill except for the pink edge of the posterior half of the mandible. Robbins, Bruun and Zim (1966: 38) state that this mark is diagnostic for Trumpeter Swans *(Olor buccinator)*. It is well illustrated in a colour photograph of a Trumpeter in Wetmore (1966:143). The large proportion and pattern of black on the head was also almost identical to the illustration in Robbins *et al.* Kortwright (1942:77) and Delacour (1954:82) write that the pink bill edging is found on the Trumpeter but not on the Whistling Swan *(Olor columbianus)*. Banko (1960:66), however, states that he has seen salmon colouring on some Whistling Swans. "So, for all practical purposes, the salmon color usually present on the dorsal portion of the basal edge of the lower mandible cannot furnish a positive indicator of either species, since overlapping characteristics are commonly observed." (Banko, p. 67). Banko (p. 65) also states "a completely black bill can represent either species . . . . "

There were two other reports of swans this summer in the Saskatoon area. On or about August 10, Ewen Coxworth and three companions saw two swans together on the South Saskatchewan River about 9 miles south of the city. On August 22, Geoffrey Galloway and several other canoeists saw a swan near Macpherson Island, within a mile of the August 10 observation. From its call, the latter bird was believed to be a Trumpeter Swan.

These birds may well have been swans from the Cypress Hills wandering northward, a late summer movement characteristic of many species of birds. The arctic-nesting Whistling Swan has not been recorded in the

Saskatoon area prior to September 23.

There is apparently only one previous report of birds that were probably Trumpeter Swans in the Saskatoon area. Sometime between May 12 and 17, 1969, Jim MacPherson, Saskatchewan Department of Natural Resources, saw four swans standing apart from a number of Whistling Swans on Goose Lake. The four appeared to be half as large again as the other swans.

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SIGHT RECORD OF SNOWY EGRET NEAR CALGARY, ALBERTA

by **D. Vaughn Weseloh** and **Rod Lazerte,** Department of Biology, University of Calgary, Calgary 44, Alberta.

On the evening of May 20, 1971, while observing Ring-billed and California gulls from a blind in a gull colony near Irricana, Alberta (35 miles NE of Calgary), we observed a Snowy Egret *(Leucophoyx thula)* alight amongst the colony and remain in the immediate vicinity for nearly an hour. At 6:15 p.m. the egret appeared from a southerly direction and landed about 50 yards from our blind on one of the four islands that comprise the gull colony. We observed the egret from the blind with a 20-40 X binocular telescope as well as with 7 X 35 binoculars at distances of 50 - 70 yards and later at about a quarter of a mile.

The egret landed on the fringe of one of the breeding islands and slowly made its way across the width of the densely nested island. It appeared to be foraging as it moved and showed no interaction with either species of nesting gull. During this time the completely white plumage, black legs, yellow feet and lores and hunched stance (as compared to the gulls) were repeatedly seen by both authors. It remained on the breeding island for about half an hour and then flew to and alighted on a long isolated peninsular loafing area on which gulls were already roosting. The egret remained there, preening and loafing, for about 20 minutes and then left the area entirely. A search, led by the junior author, was made of the area two days later but the egret could not be relocated.

The Snowy Egret is nowhere common in Canada. It is regarded only as a rare non-breeding wanderer to Alberta, Nova Scotia and Newfoundland; there are sight records for Ontario, Saskatchewan and British Columbia (Godfrey, W. E., 1966. *The Birds of Canada*, Queen's Printer, Ottawa). In Alberta, two specimens were collected in 1901 and 1910 from the SW and central parts of the province respectively (Salt, W. R. and L. Wilk, 1966. The Birds of Alberta. 2nd (Revised) edition. Dept. of Industry and Development). Salt further comments (*in litt.*) that he knows of no other sightings since that time. Tom Sadler (*in litt.*) of Strathmore, however, reports that he and his brother, Ian, observed and photographed a Snowy Egret in June of 1970 approximately 5 miles east of the present sighting.

W. Weber (*Blue Jay*, 29:134-35, Sept. 1971) recently reported the sighting of a Snowy Egret in the Cypress Lake area of Saskatchewan and has summarized the sightings for that province (the majority of which occurred in May-June). It seems apparent that the Snowy Egret is an avid wanderer and should be watched for on the prairies during the late spring - early summer period.

UNUSUAL NESTING RECORD OF RED-TAILED HAWK IN SOUTHERN ALBERTA

by **Harold W. Pinel,** 1017 - 19th Avenue N.W., and
Clifford A. Wallis, #604 314 - 14th Street N.W., Calgary

The use of cliffs by Red-tailed Hawks *(Buteo jamaicensis)* for nesting sites has been recorded previously in the literature, but in Canada, there have been few documented observations. In Washington, Red-tailed Hawks have been observed to use potholes in cliffs (Decker and Bowles, 1930). Cliff-nesting has also been recorded in California by Dixon and Bond (1933) and by Jaeger (1947). Saunders (1914) described nesting sites in Montana as "occasionally in large firs but more often on rocky ledges or faces of steep cliffs." A recent observation of cliff-nesting was reported in Ontario by Andrle (1969). From a preliminary survey of the literature, it appears that the most common occurrence of cliff-nesting in this species takes place in arid areas chararterized by a paucity of trees.

Records of large clutch size are few. Bent (1937) says that more than four eggs in a nest is unusual. One of the few observations was that of Beekman (as reported by Peyton, 1918) in Kern County, California where he found a nest containing two newly hatched young, two pipped eggs, and two eggs far advanced in incubation.

In 1971, a nest occupied by a pair of Red-tailed Hawks was found on a steep west-facing clay cliff in a coulee which empties into the Rosebud River about six miles south of Drumheller, Alberta. The general terrain can best be described as diverse. The land above the river valley and coulees is under intensive agricultural use. Along the river valley, balsam poplar *(Populus balsamifera)* and willows *(Salix* sp.*)* predominate. In the drier areas, native grassland and sagebrush *(Artemisia cana)* are dominant. In the coulee where the nest was found, white spruce *(Picea glauca)* and aspen *(Populus tremuloides)* flank the east-facing slope. The west-facing slope was bare

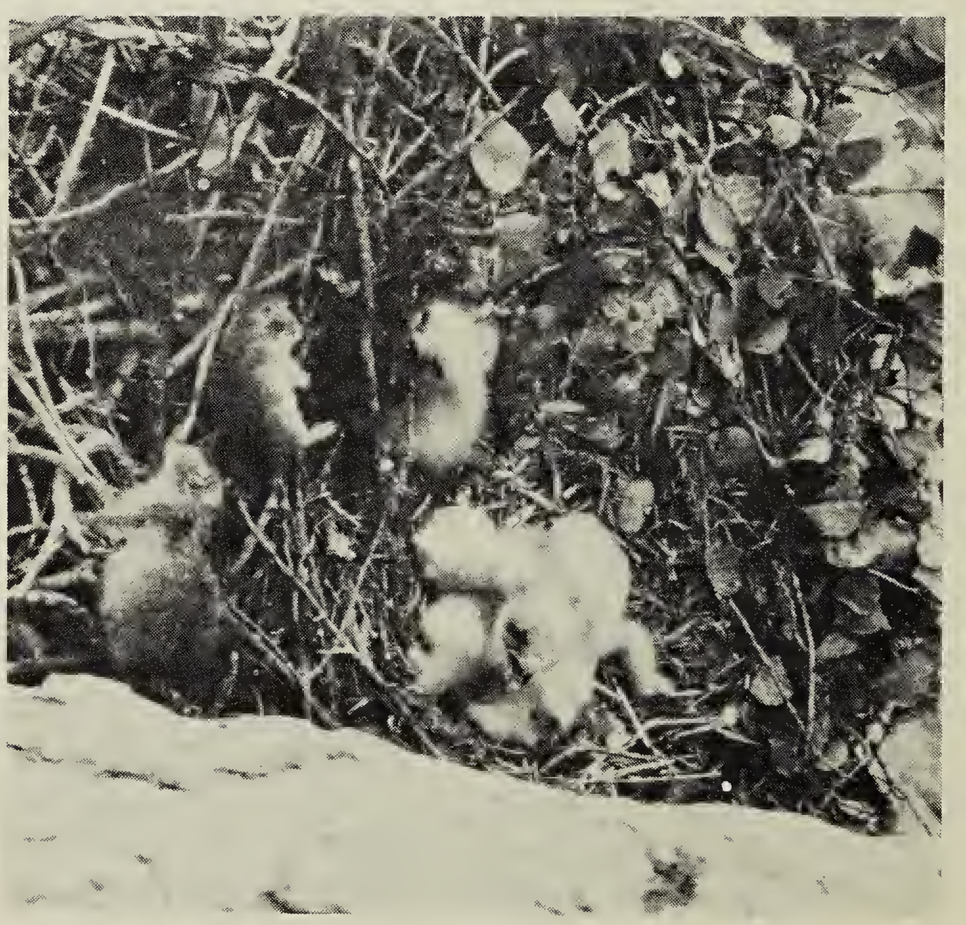

Fig. 1 Looking down on Red-tailed Hawk nest, June 5, 1971.

except for scattered areas of grasses and sage.

The nest was on a narrow clay ledge 60 feet up on an 80-foot high cliff It was approximately two feet in diameter, one foot in height, and was composed of aspen twigs lined with coarse grasses. On May 2, 1971 the nest contained three eggs. A further visit was paid to the nest on June 5 at which time four downy young, a heavily incubated egg, two Richardson ground squirrels *(Citellus richardsonii)* and one meadow vole *(Microtus pennsylvanicus)* were in the nest (see Fig. 1). During each of these visits, both adults soared overhead screaming their annoyance. A final visit to the nest was made on June 27 at which time the nest was empty. One of the adult birds still protested as the nest was approached.

Upon examination of the dates involved and the size of the young on June 5, we concluded that none of the young survived. A possible explanation for this could be the exceptionally heavy June rains. Support for this hypothesis is the fact that the nest was well exposed in the direction of the prevailing winds. The food supply was abundant, as previously mentioned, and as evidenced by our observations at four Ferruginous Hawk *(Buteo regalis)* nests in the same general area. We feel that this eliminates starvation as a factor. Predation seems unlikely due to the inaccessibility of the nesting site.

In summary, this observation is interesting because of the fact that it is a cliff-nesting record, the clutch size is unusually large and there is a scarcity of reports of this occurrence, especially in western Canada. In six years of observation in southern Alberta, this is our only record.

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A PROBABLE PINNATED GROUSE NEAR MORTLACH

by **Frank Brazier,** Regina

"This species is not now believed to occur anywhere in the province . . . ." Thus comment Nero and Lein when annotating the Greater Prairie Chicken or Pinnated Grouse *(Tympanuchus cupido)* in S.N.H.S. Special Publication No. 7 "*Birds of Moose Mountain, Saskatchewan*".

On Sunday, December 19, 1971 at 4:00 p.m. I was driving west on Alternate No. 1 Highway between Caron and Mortlach. It was an overcast day but rather bright. The rolling topography thereabouts is due to the sand dunes which, though clothed now in prairie grasses, forbs and shrubs (ah! the scent of Wolf Willow in the spring!) and with dense aspen groves in the hollows, are invisible but real enough under the vegetation. Because this is grouse country and the Sharp-tailed Grouse is tolerably common, I took no particular notice when I saw a single grouse flying towards me from the southwest. It cut across the road just ahead of me, flying quite low—at eye level or a little higher—and disappeared northeasterly over a bush-crowned low hill.

As the bird crossed the road ahead of me, it was briefly silhouetted against the sky. I saw that it was very dark, short-tailed, peak-headed, and the head area bore two long (three inches, I judged) stiff appendages. As I cut its line of flight moments after it passed, I looked behind to my right and got a rear view of the bird just before it disappeared—there was no trace of white.

The Pinnated Grouse is so rare that I am not claiming a positive sighting after so brief an acquaintance. This incident reminded me of another possible "rare bird" glimpse described by Michael Sharland in "*A Territory of Birds*" (1964, London and Adelaide). The author was attempting to prove the existence of the near-extinct Night Parrot of Central Australia and had staked out a watering tank where it, along with the only other nocturnal drinking parrot, Bourke Parrot, might appear. He describes his brief experience: "So after closely examining the birds on the tank I swung the beam of the torch to the trough, expecting to see nothing but Bourke Parrots. But before I was able to adjust my vision to the greater distance I saw a different bird suddenly fly from a fence alongside the trough. There was a flick of wings, and it was lost in the darkness. But, weak as the light was, in that fleeting moment it had seemed to me to be larger and greener than the Bourke Parrots that were with it. It was a single bird only, more robust and green than the Bourkes, and obviously a parrot. It could be nothing, I felt sure, but a Night Parrot . . . ."

Of such flimsy stuff is the fun of birding made.

For my bird there are only three possibilities. The dark body colour I saw could have been caused by the poor quality of the daylight—a Sharp-tail would have appeared dark. The short tail may have been the result of a Sharp-tail's losing the long tail feathers, or it could betoken a Ruffed Grouse which would account for the lack of posterior white. The peaked head is a feature common to all three grouse, but I must say that of all the hundreds of Sharp-tails I have seen in similar circumstances their head tops have invariably presented a smooth, rounded contour. In some pictures I have seen of the Pinnated Grouse the anterior end of the comb is shown as a peak; in other pictures head feathers form a peak as they do in both the Sharp-tailed and Ruffed Grouse.

I cannot explain away the three-inch appendages which I saw so plainly when the bird flew across my path. They could only be the pinnae from which the grouse derives its name. I have never seen a Sharp-tailed or a Ruffed Grouse flying which exhibited all the features which led me to believe the bird I saw was a Pinnated Grouse—short tail, peaked head, neck appendages, dark tail region, dark body colour.

The area is accessible. Perhaps other birders will keep an eye peeled for this elusive species.

TOWNSEND'S SOLITAIRE AND BLACK-HEADED GROSBEAK AT WEYBURN

by **Robert Kreba,** 144 Milne St., Regina

On September 7, 1970, I had the good fortune to see both a Townsend's Solitaire and a Black-headed Grosbeak at the Saskatchewan Hospital grounds, Weyburn. It was fairly warm when Garry Holtz of Weyburn and I set out at about 6:40 a.m. The sky was slightly overcast, resulting in subdued lighting with no harsh shadows, making for ideal viewing conditions.

The Weyburn area had been invaded by a large influx of Rose-breasted Grosbeaks, which had first appeared about August 25. On August 27, 28, and 31, I had tentatively identified some females as Black-headed Grosbeaks, but I was not certain because of poor viewing conditions and their close resemblance to female Rose-breasted Grosbeaks. Alerted to the possibility of their presence in the area, I was especially eager to find a male Black-headed Grosbeak.

At about 7:15 a.m., Garry Holtz and

I heard the sharp "peek" call characteristic of both grosbeak species. The bird was calling from a small copse of trees 25-30 feet in height, which we both entered in order to find and identify the caller. I saw the bird perched at the top of one of the trees, and identified it as a male Black-headed Grosbeak. The head was black, with a yellowish-brown eyeline reaching to slightly above the eye. The chest, belly, and nape were the same orange-brown colour as the eyeline. The wings and tail were black, with conspicuous white markings. I called to Mr. Holtz, so that he could see the bird also, but as I did, the bird took alarm and flew off. We saw no other grosbeaks of either species that day.

The Black-headed Grosbeak breeds mainly in southern British Columbia, and occasionally in the Cypress Hills area of Saskatchewan and Alberta. According to Godfrey (*The birds of Canada*, Natl. Mus. Can. Bull. 203, 1966), it often ranges far to the east of its breeding range in fall, and has occurred in Saskatchewan at Regina, Estevan, Lake Johnston, and near Armley. In Manitoba, it has strayed to Treesbank and Delta.

Only a few hundred yards and 10 minutes later, we came upon a Townsend's Solitaire perched in a small bare tree about five feet from the ground. This bird was exceedingly tame, and allowed us to examine it at close range from several angles. It matched the illustration on page 231 of *Birds of North America* (Robbins, *et al*, 1966) perfectly, its prominent white eye ring, greyish-brown underparts, and slightly notched tail separating it from the Mockingbird. We observed the Solitaire for about five minutes, at the end of which time it flew to the top of a taller tree about 20 yards away. When we left, it was still perched in this tree.

The occurrence of Townsend's Solitaire in Saskatchewan has been summarized by Sealy (*Blue Jay*, 29:184-196, 1971).

TOWNSEND'S SOLITAIRE NESTING IN CYPRESS HILLS, ALBERTA

by **Edgar T. Jones,** 6115-141st St., Edmonton

EDITOR'S NOTE: According to Salt and Wilk (The birds of Alberta, Second Ed., 1966) Townsend's Solitaire has not been recorded nesting outside of the mountains and foothills of southwestern Alberta. Thus, the present observation is a first record for Cypress Hills as well as for the region outside of the foothills. Sealy recently reviewed all records of this species in Saskatchewan (Blue Jay, 29:188-190), December 1971).

During August 1971, Rod Burns, my son Gary and I spent several days in the Cypress Hills Provincial Park, near Elkwater, Alberta. On August 2nd we discovered what appears to be the first nest of this species for the region. The nest, which was a bulky affair of dried weeds and grasses, contained four young approximately two-thirds grown. Both adults were in attendance and both were filmed at and near the nest. The nest was about eight feet above the bottom of a 50 foot conglomerate cliff, the base of which had slid away in past years The nest was in a small, natural hollow about 10 inches in depth on the face of the cliff. A second nest found within 50 feet of the first seemed to have been built the same year. It was in an excellent state of repair and although empty there was no visible sign of predation.

We were impressed with the wide variety of birds and flowers in the vicinity, many of which one normally associates with the mountain regions. Red Crossbills were common, and Pine Siskins, Myrtle Warblers, Red-breasted Nuthatches, Goshawks, and Swainson's Hawks were also observed. On previous visits to the area, Audubon's Warbler, MacGillivray's Warbler and Yellowthroats were observed.

BIRD BANDING AND NEST-BOX PROJECTS AT EDMONTON

by **Ken Trann,** 10725 85th Avenue, Edmonton

In 1970 we formed a banding group in Edmonton whose main interest was banding birds of prey. At a recent meeting, held January 13, 1972 at the home of Richard Fyfe, it was possible to summarize two years of banding activities (Table 1) and to review the programme and its problems.

Much of our banding has involved nestlings, but we have also used the Bal-shatri, mist nets, pole traps, and suede traps, which allow us to band adults. The 270 Sparrow Hawks which we banded were all caught with a Bal-shatri. The Snowy Owls were mainly caught with a mist net, and the Great Gray Owls and Hawk Owls were trapped with a Bal-shatri and banded at the nest. Most of the other birds were banded as nestlings.

The following have participated in the banding programme: Richard Fyfe, Ron Gallant, Bob Gehlert, Bob Gibbon, Keith Hodson, Edgar Jones, Bryan Nicolai, Ken Trann.

Some of us are also involved in a nest-box project, encouraged by the success of similar projects in Manitoba and Saskatchewan. Edgar T. Jones allowed us access to his 228 acres of land on Hastings Lake as a starting point, and in the first year (1969) we set out 45 bluebird houses. The number was increased to 163 in 1970, and to 306 in 1971. Our trail is not yet extensive, but we are working out in all directions from Ed Jones' property.

In addition to the houses built to attract Mountain Bluebirds, we have put up two Purple Martin colony houses (which have had five pairs both in 1970 and 1971), and we have also set out larger houses for Goldeneye, Bufflehead, and the smaller owls. These have not been very successful, but we have had a pair of Goldeneye for three years in a row, and one pair of Boreal Owls. Most of the larger houses have been occupied by Flying Squirrels and Red Squirrels, and by Starlings. We have attempted to destroy the Starlings by keeping the young birds from reaching maturity. House Sparrows were not a problem until this year when we began putting houses out along the roads between Sherwood Park and Hastings Lake. We have destroyed their nests and because House Sparrows seem to prefer houses close to farms, we are removing those nest boxes that are in the vicinity of farmsteads.

We have had very little vandalism, and we feel that the project has been a rewarding one. The results of the project are summarized in Table 2. We would like to think that some day our bluebird trail might join Saskatchewan's, just as Saskatchewan's trail is now linked with Manitoba's. The fol-

Table 1. Birds banded by Edmonton bird banders in 1970 and 1971.

Species	1970	1971	2-year total
Goshawk	–	2	2
Sharp-shinned Hawk	–	5	5
Cooper's Hawk	–	5	5
Red-tailed Hawk	25	5	30
Broad-winged Hawk	2	5	7
Swainson's Hawk	–	12	12
Ferruginous Hawk	65	139	204
Golden Eagle	–	6	6
Marsh Hawk	19	–	19
Prairie Falcon	116	140	256
Peregrine Falcon	2	14	16
Pigeon Hawk	91	138	229
Sparrow Hawk	56	214	270
Great Horned Owl	23	50	73
Snowy Owl	1	15	16
Hawk Owl	16	27	43
Great Gray Owl	6	15	21
Long-eared Owl	10	4	14
Short-eared Owl	36	7	43
Boreal Owl	–	1	1
Saw-whet Owl	–	1	1
Total individuals	468	805	1273

Table 2. Results of nest-box project at Edmonton, 1969-71.

Species	1969			1970			1971			Three-year total		
	No. Nests	Fail	Young	No. Nests	Fail	Young	No. Nests	Fail	Young	No. Nests	Fail	Young
Goldeneye	1	-	9	1	-	8	1	1	-	3	1	17
Boreal Owl	1	-	5	-	-	-	-	-	-	1	-	5
Say's Phoebe	1	1	-	-	-	-	-	-	-	1	1	-
Tree Swallow	18	4	61	41	8	114	93	22	443	152	34	618
House Wren	14	5	27	10	1	57	9	1	53	33	7	137
Mountain Bluebird	3	1	11	7	3	22	10	5	26	20	9	59
Common Grackle	-	-	-	1	-	2	-	-	-	1	-	2
Totals	38	11	113	60	12	203	113	29	522	211	52	838
Number of houses	45			163			306			514		

lowing people have contributed to the project: Rod Burns, Jon De Groot, Ron Gallant, Jim Gara, Edgar Jones, Wayne Mlynarchuk, Bryan Nicolai, Terry Olander, Randy Rachinsky, Andy Stork, Gloria Trann. In addition, Steve Tough has kindly allowed us to use his garage, and Fred Stapely has given us the use of his truck.

A BARRED OWL RECORD

by **Wayne C. Harris**, Raymore

Because of the scarcity of Saskatchewan records of the Barred Owl, I thought the following worth noting. While at Clearsand Lake (6 miles west of Candle Lake or 18 miles east of Prince Albert National Park) on August 28-29, 1971 I had the great fortune of seeing this rare owl and hearing another. On August 28, about an hour before sunset, while walking about ¼ of a mile from our camp on the east shore of Clearsand Lake, a Barred Owl was heard calling about 100 yards farther ahead. At the same time another bird began hooting about ½ mile east of the first bird. I located the first bird and was able to approach to within 30 yards of it and observed it for about 5 minutes with binoculars. While I was watching this bird the other continued to call from deeper in the bush. The second owl was not observed but its call positively identified it as a Barred Owl.

I immediately returned to camp and A. L. Nijssen and myself returned within 10 minutes but were unable to locate the owl again as it had moved from its original position and both birds had ceased hooting.

NEST RECORDS

A summary for the 1971 season is being prepared and will be available to anyone interested in participating in the Prairie Nest Records Scheme. Cards for the 1972 nesting season can be obtained from H. W. R. Copland, Coordinator Prairie Nest Records Scheme, Manitoba Museum of Man and Nature, 190 Rupert Ave,, Winnipeg. R3B 0N2

LAZULI BUNTINGS IN MANITOBA

by **Brian N. Turner,** Atomic Energy of Canada, Limited,
Whiteshell Nuclear Research Establishment, Pinawa, Manitoba

The Lazuli Bunting *(Passerina amoena)* breeds in Canada from south-central British Columbia to central Saskatchewan (Godfrey, 1966; Figure 1), but is an infrequent visitor of Manitoba. The Manitoba Museum of Man and Nature check-list records it as of "irregular occurrence", and it has been reported only six times since an initial sighting in 1928 (Table 1, Figure 2). The occurrence of two independent sightings in the fall of 1971 prompted a summary of previous records.

Once seen, the Lazuli Bunting (especially the male) is not likely to be forgotten. The turquoise-blue upper parts and throat of the male allow it to be confused only with bluebirds or the closely related Indigo Bunting *(Passerina cyanea)*. However, double, white wing-bars, cinnamon upper breast and finch-like bill distinguish the Lazuli. The Indigo Bunting lacks the wing bars and cinnamon breast, has a blue rather than white abdomen, and is a deeper blue above and below. The brownish female Lazuli also shows the wing bars and breast colouration, along with a hint of blue on some of the upper surfaces.

The Lazuli Bunting is characteristically a western species, the Indigo an eastern one. At least since the last Pleistocene glaciation the two species have been separated by the Great Plains grasslands. However, man's alteration of the grasslands through the planting of shelterbelts and control of fire has allowed both species to extend their ranges, resulting in overlap and hybridization (Sibley and Short, 1959).

Lazulis winter from southern Baja California and southern Arizona south to south-central Mexico (Godfrey, 1966). Their northward migration begins in late March, and they eventually occupy a breeding distribution in Canada extending from southern British Columbia to south-central Saskatchewan (Godfrey, 1966), and probably to southeastern Saskatchewan, where Godfrey (personal communication) observed one, or possibly two, singing males at Estevan in June, 1968. Nero and Lein (1971:49) collected two male Lazuli Bunting X Indigo Bunting hybrids at Moose Mountain, Saskatchewan, June 4 and June 18, 1965. One had predominantly Lazuli features, the other, predominantly Indigo features. The species has been reported from most counties of western North Dakota (R. E. Stewart, personal communication) with a number of North Dakota sightings near the Canada-United States border, extending to about 50 miles east of the Saskatchewan-Manitoba border. Bent (1968) noted reports from extreme northeastern South Dakota, and from Minnesota and Iowa.

Typical habitat includes clearings, shelterbelts, woodland edges and brushy areas (Sibley and Short, 1959; Godfrey, 1966; Bent, 1968). Grinnell and Miller (cited in Bent, 1968) emphasize a "low dense tangle" is used for nesting. In North Dakota preferred habitats are wood-bordered streams, semi-open woodlands on prominent hills and escarpments, and well-drained flood-plains of major streams (R. E. Stewart, personal communication).

The observation prompting this report occurred on October 11, 1971 at Pinawa, Manitoba (Figure 2). At about 4 p.m., Ian Hamilton (of Castlegar, British Columbia) and I saw a small flock of sparrow-sized birds on power line wires at the eastern periphery of Pinawa. As we approached by car, the flock flew approximately 150 feet farther along the road, then settled on the wires again. We parked below them within about 25 feet, and using binoculars and Peterson's (1961) guide, identified several as Lazuli Buntings. The stubby bill, white wing bars, two-coloured breast and blue parts of the male were all evident. At

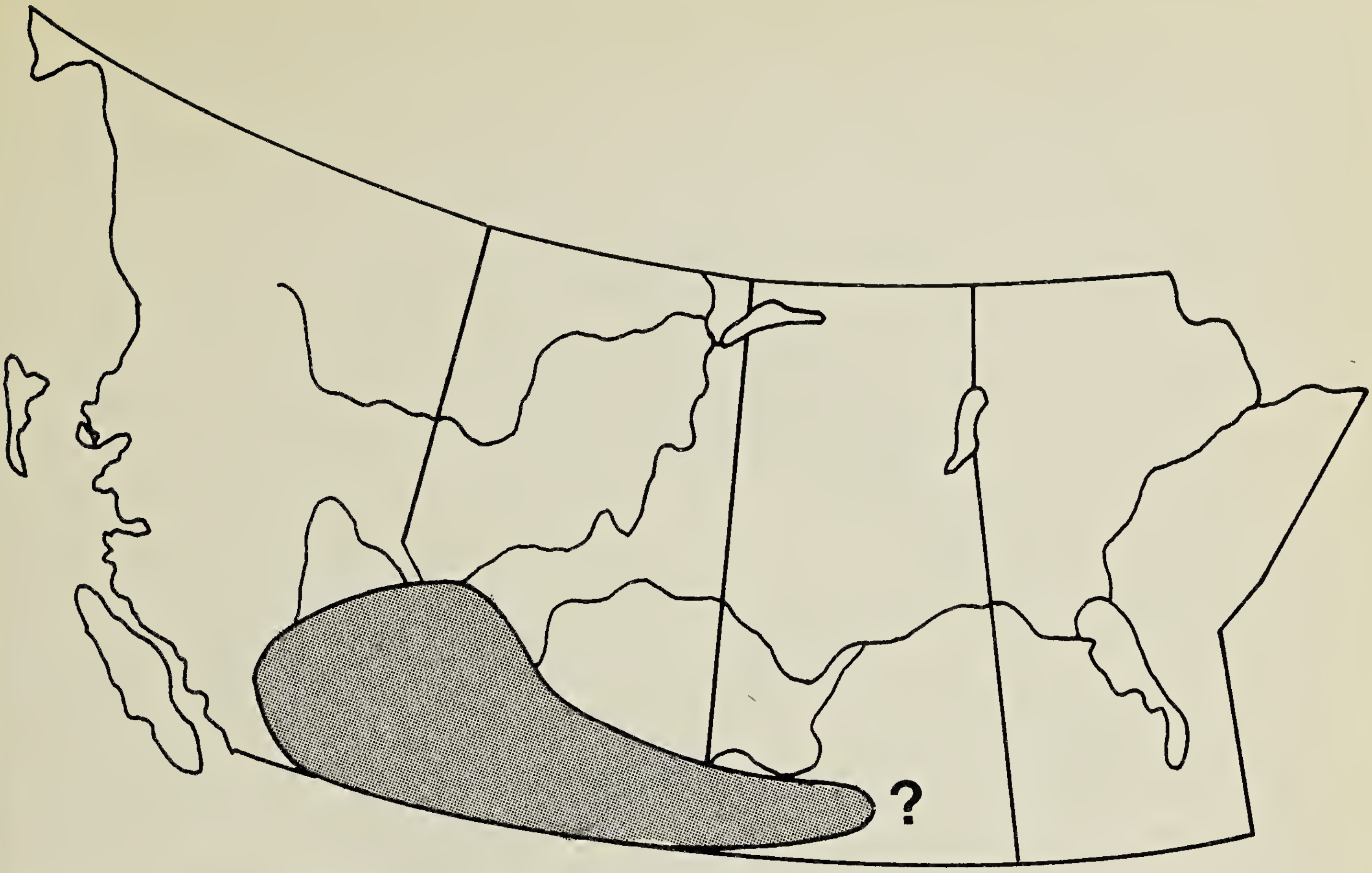

Fig. 1 Breeding distribution of Lazuli Bunting in Canada. From Godfrey (1966).

one point a male and female perched beside each other, allowing comparison of the sexes. The rather plain female would have been difficult to identify without the distinctively coloured male present. We identified at least six Lazulis, and guessed that other small birds nearby were of the same species. Weather at the time of the sighting was 44°F, with a NNW wind of 7 mph and broken cloud.

The sighting was within several hundred yards of the Winnipeg River, in an area that is mainly boreal forest. The woods adjacent to the power line was composed of 15-20 foot trembling aspen (about half of their leaves had fallen), with scattered white spruce. The portion of woods was about 150 feet wide, between the road and golf course fairway. The main shrubs were hazel and rose (many bearing hips), with plentiful seeding thistles, sow-thistles, goldenrod and asters present. On the day after the sighting, we returned with cameras, but the buntings were no longer present, and the species still remains to be verified by photograph or specimen in Manitoba.

Another possible occurrence of Lazuli Buntings in Manitoba was reported to me by Wayne Cowan, a zoology graduate student, University of Manitoba. A flock of about 20 birds believed by him to be male Lazuli Buntings was sighted on October 5, 1971 about one-half mile north of Inwood and about 65 miles northwest of Pinawa (Figure 2). The birds were seen on the ground in a pasture, on a fence and in adjacent trees on a cool, sunny day. Unfortunately, no binoculars were available and they were observed no closer than 50 feet. The number of individuals reported is unusually large for this species and the sighting was made under poor circumstances. Nevertheless, though unverified, this record is of interest in view of our Pinawa observation less than a week later.

There are several unique aspects to the Pinawa sighting. This is apparently the first report of the female Lazuli Bunting in Manitoba. Since the females are rather plain, only a very experienced birdwatcher would recognize them if males were not present. Pinawa represents the most easterly

Lazuli Bunting from a Ralph D. Carson painting
(Collection of six different paintings available from Provincial Museum and Archives of Alberta, Edmonton, 50¢ each or 2.50 for the set of six.)

point at which the species has been seen in Manitoba, and the October 11 sighting is the latest fall one to date. The total numbers observed this fall considerably exceed the maximum of two reported in any previous year. However, we have no evidence that the species breeds this far east, and can only conclude that these were migrants several hundred miles from their usual breeding areas. Lazulis have been reported east of their range in other years (Virginia: *Audubon Field-Notes*, 20:409, 1966; Wisconsin: *Audubon Field-Notes*, 21:512, 1967) and are listed as casual visitors in western Minnesota and western Missouri (A.O.U., 1957). Godfrey's (1966) breeding distribution map summarizes the known furthermost extent of breeding, but does not indicate that the species abundance varies every year, particularly at the periphery of its range. A fluctuation in density from

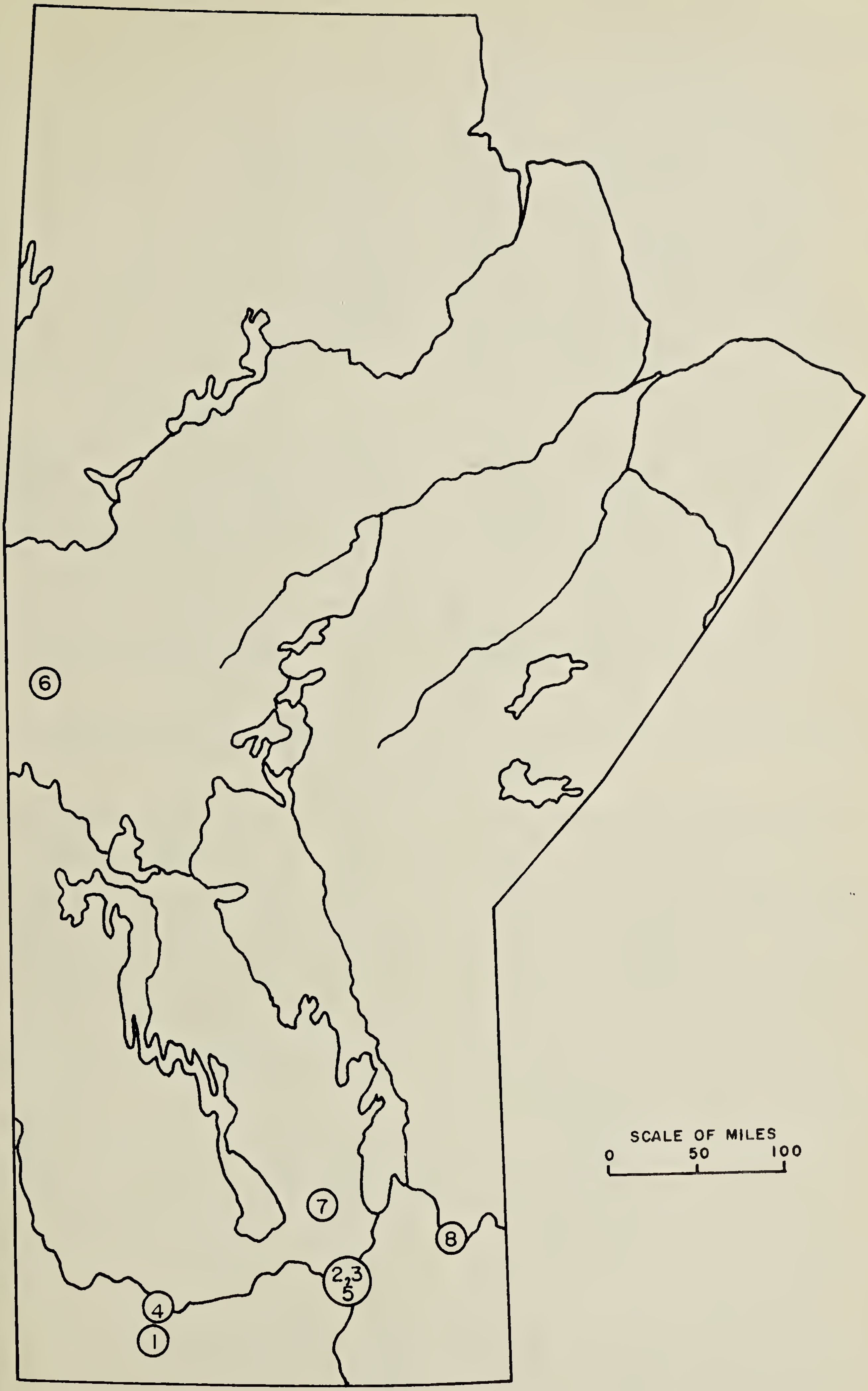

Fig. 2 Locations of Manitoba sightings of Lazuli Buntings. The numbers refer to sightings listed in Table 1.

TABLE 1

SUMMARY OF MANITOBA SIGHTINGS OF LAZULI BUNTINGS

Source	Observer	Date	Location	Sex	Remarks
1. Lawrence (1931)	Mrs. J. S. Nicholson	"spring", 1928 May 19, 1931	Belmont Belmont	1 male 1 male	Both sighted after snowstorms, latter feeding on suet in yard.
2. Lawrence (1935)	J. Pollock and W. Havelock Later observed by others	May 26, 1935	Fort Garry (Winnipeg)	1 male	Unobstructed views in a number of locations at different times.
3. Lawrence (1946)	A. Lane	Oct. 9, 1946	Varsity View (Winnipeg)	2 males	10 feet from window, in an oak tree in garden.
4. Lawrence (1954)	S. Criddle	May 20, 1954	Treesbank	1 male	No details
5. Mossop (1955)	W. Adams	May 19, 1955	Winnipeg	1	No details
6. Mossop (1963)	H. Mossop	late June, 1963	Cranberry Portage	1 male	Singing from treetop.
7. Personal communication to author from W. Cowan		Possible observation at Inwood, October 5, 1971; see text.			
8. This report	I. Hamilton B. N. Turner	Oct. 11, 1971	Pinawa	At least 6, both sexes	On power line wires, less than 25 feet away.

year to year is indicated by the Saskatchewan records as reported in *The Blue Jay*. Since 1942, a Saskatchewan sighting has been recorded in less than half the years to the present. Sightings in Manitoba would therefore be rarer, due to its position east of the breeding range, and irregular, as they have been in Saskatchewan. However, it is apparent that the species can be expected, at least in some years, to migrate through Manitoba, and a familiarity with the species characteristics would prepare the Manitoba birdwatcher to recognize this colourful species.

Acknowledgments

Herbert W. R. Copland and Robert W. Nero aided in locating previous Manitoba records of the Lazuli Bunting. Dr. Nero and my WNRE colleagues provided useful comments on the manuscript. R. E. Stewart is thanked for providing his extensive North Dakota records, and W. E. Godfrey for his Estevan record.

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WESTERN GREBE FATALLY ENTANGLED IN FISHING LINE

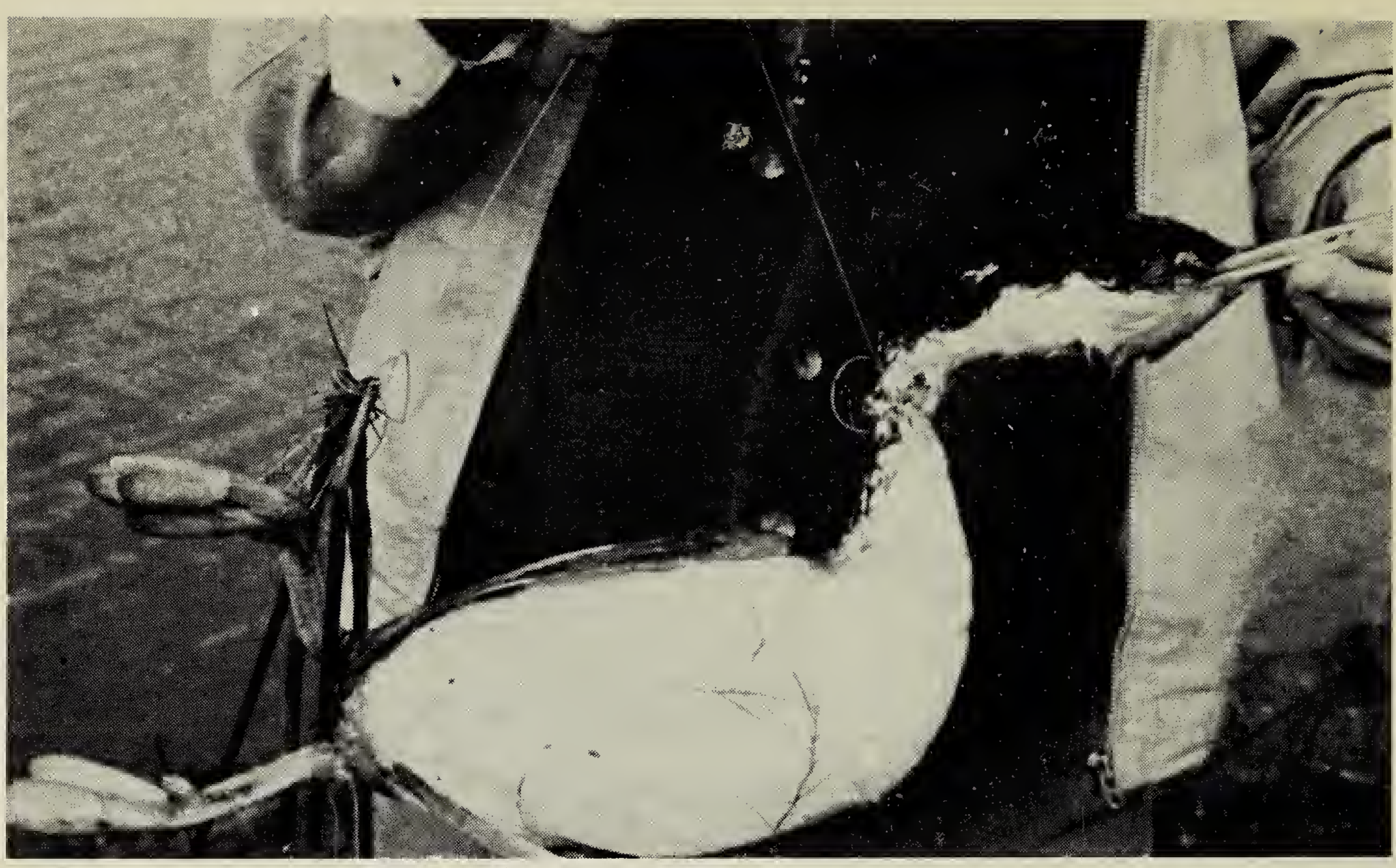
by **Robert W. Nero,** Department of Mines, Resources and Environmental Management, Box 19, 139 Tuxedo Blvd., Winnipeg R3C 0V8

Birds are affected by a host of natural and unnatural or man-made mortality factors. More than two million observations of non-hunting mortality in waterfowl, for example, were recorded in the following categories: "pollution, collisions, predation, disease, weather, and miscellaneous" (Cornwell, 1968).

Some unusual accidents have befallen Western Grebes in the Prairie Provinces: large-scale deaths due to a sudden freeze-up were noted in Alberta (Nero, 1960); "wetting", a break-down in the waterproofing system of plumage, and even entanglement in a rubber prophylactic ring (with probable eventual death) occurred at a sewage lagoon in Saskatchewan (Nero, 1968); and large numbers were drowned in gill-nets set for fish in Manitoba (Bartonek, 1965).

The hazard to birds of fishermen's lures and even the possibility of birds becoming entangled in fishermen's lines while the latter are fishing has been noted (Campbell, 1967). A recent observation involving a Western Grebe indicates the additional hazard of discarded lengths of fishing line.

On September 23, 1971, a dead adult Western Grebe was found floating upside down in shallow water adjacent to an earth-fill dam across a narrow inlet at the Last Mountain Lake Wildlife Area, Saskatchewan. As the photograph shows, the bird was trapped in several feet of monofilament nylon fishing line wrapped around its neck and one foot. The line was tightly drawn in two or three loops around the neck, presumably causing death by strangulation or drowning. The grebe may have become entangled in an



From color transparency by Gerald W. Malaher

Western Grebe fatally entangled in fishing line.

intact fishing line which was then cut loose by a fisherman. It seems more likely, however, that the bird had encountered a length of discarded and possibly tangled line.

The bay in which the grebe was found led to the open lake where numerous Western Grebes could be heard calling. A few grebes were seen diving for food close to the dam, which had recently been constructed to manage water levels for the benefit of waterfowl. Fishermen reportedly were quick to take advantage of an access roadway across the dam and enjoyed good fishing from this vantage point.

A similar situation exists in Hecla Island Provincial Park in Manitoba. A recently constructed causeway between the mainland and Hecla Island on Lake Winnipeg crosses a marsh where Western Grebes have been abundant. The causeway provides a new opportunity for bird watchers as well as for fishermen. One can only urge fishermen to use some caution in fishing in areas where grebes are feeding, but perhaps it should be forbidden to throw discarded line into the water. The durability of fishing line and the tendency of monofilament line especially to form loops make it a potential hazard to waterbirds. Although this is probably only a slight danger, disposal of discarded fishing line in lakes and streams is littering and as such should be discouraged.

Environmental pollutants, especially biocides, are undoubtedly more significant hazards for grebes and other fish-eating birds. High levels of DDE have recently been found in eggs collected from Western Grebe colonies in the Prairie Provinces (Vermeer and Reynolds, 1970), though possible effects on reproduction are not yet known.

Thanks are due Gordon H. Staines for assistance in retrieving the grebe and Gerald W. Malaher for the use of his photograph.

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EASTERN KINGBIRD ON SOUTHAMPTON ISLAND, N.W.T.

by **R. Barry Ranford,** 1345 Kendall Rd., Mississauga, Ontario

On June 23, 1971 at 9:00 a.m. the author discovered a lone Eastern Kingbird *(Tyrannus tyrannus)* perched on a clump of dwarf willow 1½ miles northwest of the settlement of Coral Harbour, Southampton Island, N.W.T. The bird remained on the same perch and was observed for 10 minutes from a distance of about 25 feet. It seemed in the process of drying its plumage, for a cloudburst had recently passed. The bird was last observed flying due north.

Neither Sutton (1932), Bray (1945), nor Taverner (1943) report a kingbird in this area. However, there is a record for this species from Coats Island 55 miles to the south (Godfrey, 1966).

A specimen found dead in July 1967 by Jonkel (1970) on Leyson Point 40 miles south and 65 miles east of Coral Harbour was the previous northernmost record for eastern Canada.

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OBSERVATIONS OF NESTING MARSH HAWKS IN MANITOBA

by **Richard J. Clark,** N.Y. Cooperative Wildlife Research Unit, Cornell Univ., Ithaca, N.Y.[1]

During the summers of 1968-1969 I had an opportunity to make incidental observations on the nesting behaviour of Marsh Hawks *(Circus cyaneus hudsonius)* while studying the breeding behaviour of the Short-eared Owl *(Asio flammeus)*. Grateful acknowledgment is made for a Frank M. Chapman Grant from the American Museum of Natural History and a National Audubon Society Fellowship, as well as to Dr. H. Albert Hochbaum and the Delta Waterfowl Research Station for encouragement and support. I also wish to thank Drs. Walter R. Spofford and Robert W. Nero for helpful suggestions concerning the manuscript.

The same area was studied both summers and was about three square miles in extent. The soil is poorly drained, high lime, lake-washed till (Bird, 1961). The plot is located south of the Aspen Parkland ecotone with only a few small aspen *(Populus tremuloides)* groves scattered widely. The first three sections east of the hamlet of Marquette and south of the road running east from that village comprise a major part of the area. It is a region of low relief (less than 25 feet for the whole area) at about 800 feet elevation (see Fig. 1). Areas of differing moisture content occur, ranging from low, permanently water-soaked to temporarily water-soaked and temporarily dry to permanently dry. Dominant vegetation generally associated with the previously stated moisture conditions was: a) willows *(Salix spp.)*, sedges *(Carex spp.)* and rushes (*Juncus* spp.), b) wild barley (*Hordeum jubatum*), c) couch grass (*Agropyron repens*) and bluegrass (*Poa* spp.) and d) snowberry (*Symphoricarpos occidentalis*) or rose (*Rosa* sp.) in the same order. Land use for the area has been restricted to haying

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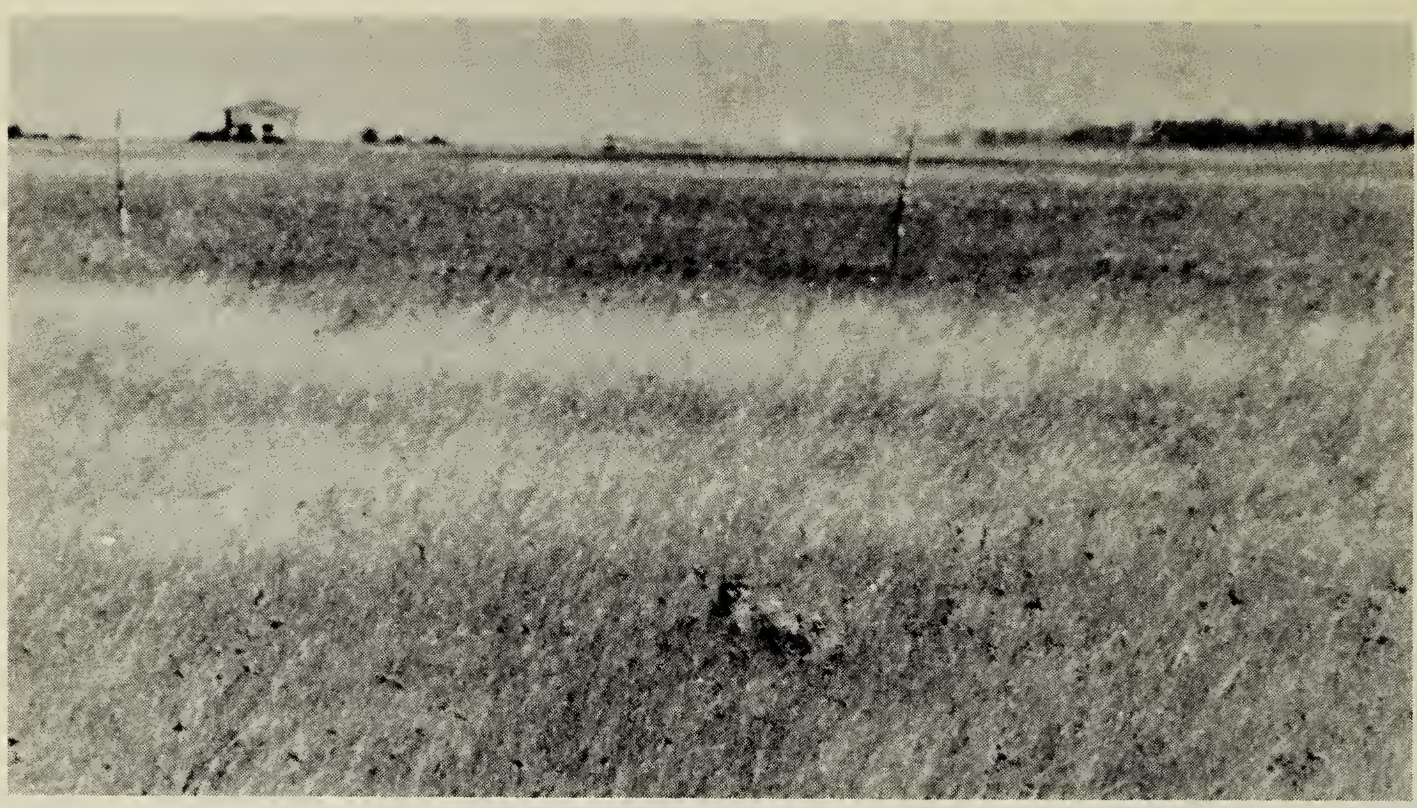


Fig. 1 View of the study area looking towards Meadows, Manitoba

or pasturing for the most part, although some cereal crops have been grown on parts of it in drier years.

Two contrasting aspects observed in the area are worthty of mention. First, snap-trapping revealed that voles *(Microtus pennsylvanicus)* were relatively scarce during the 1968 season (40 voles per 1000 trap-nights in late June and early July) and very abundant in the 1969 season (410 voles per 1000 trap-nights in early June). Second, there was 5.8 inches above normal of rain in July and August, 1968. This is a considerable amount for an area that annually averages about 20 inches of rain (Monthly Record, 1968). The 1968 wet condition most certainly contributed to the increase in voles in 1969 for much of the grain in surrounding areas was unharvested in the summer and fall of 1968, providing a wealth of food for wintering voles. Deep, persisting snow which moderated the ground temperatures during the 1968-1969 winter was undoubtedly an additional factor in the favour of voles.

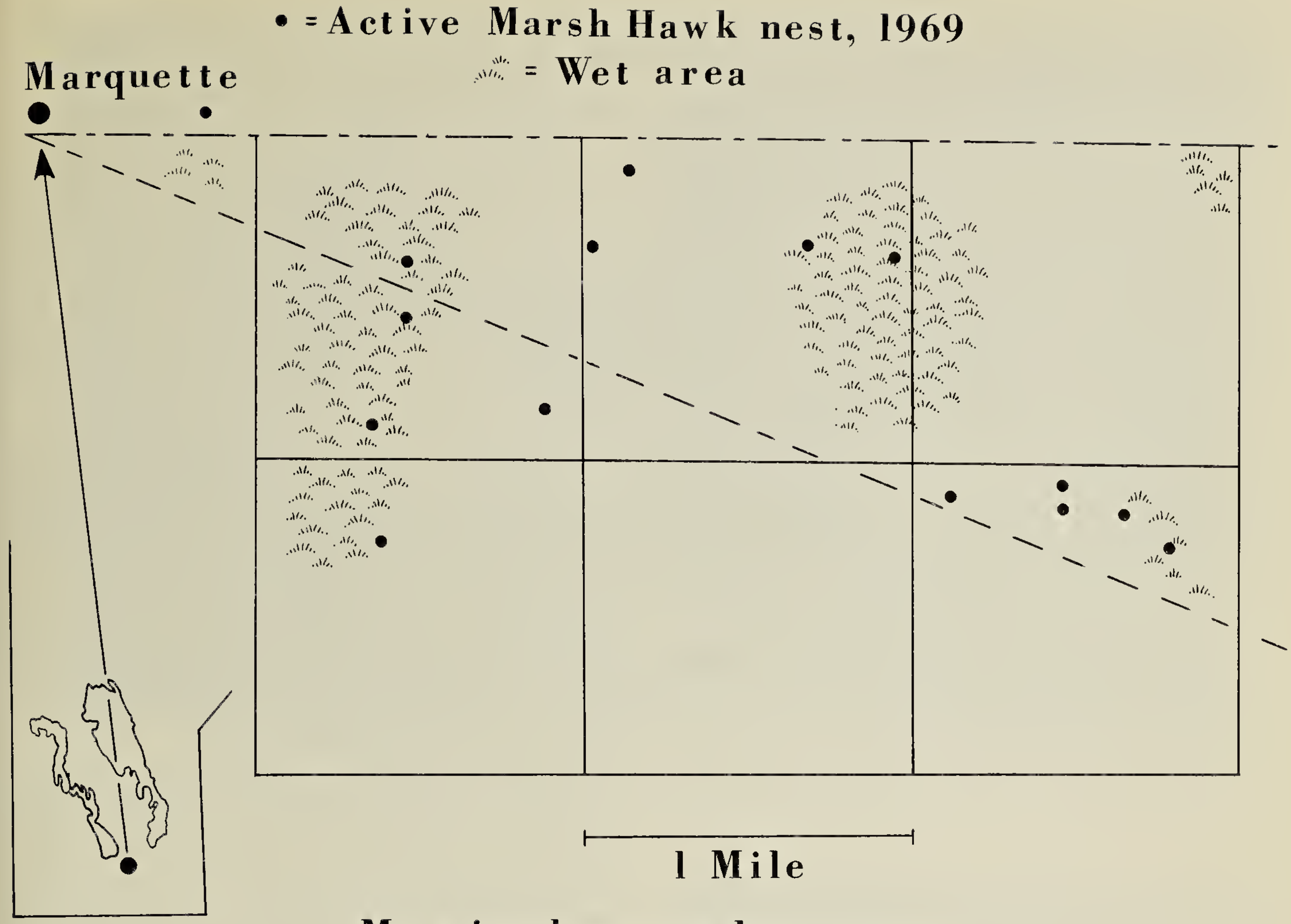
During the summer of 1968 only about three nesting pairs of Marsh Hawks occupied the area. In 1969, however, at least 15 nests were active (Fig. 2).

As I did not arrive in the area until May 8, 1969 I did not observe the initial influx of hawks. There was considerable "sky dancing" by males at the time of my arrival, e.g., 12 different individuals were observed in a 10-minute period (May 13). This activity tapered off after about the first week.

Table 1. Marsh Hawk clutch size data for the Marquette, Manitoba region compared to that for Upham, North Dakota.*

Total nests with complete clutches	1937*	1938*	1939*	1969
	31	16	13	13
Total eggs in complete clutches	151	84	68	66
Nests with:				
three eggs	1	–	–	–
four eggs	8	3	1	5
five eggs	17	6	8	3
six eggs	4	7	4	4
seven eggs	1	–	–	1
Mean number of eggs per clutch	4.87	5.25	5.233	5.07

*Hammond and Henry (1949).



Manitoba study area

I back-dated eggs to establish first laying dates. This can, however, be misleading; for example, one nest contained three eggs on May 16, five eggs on May 27 and six eggs on May 29, giving a laying period of at least 13 days for the last three eggs, or a mean interval between layings of 4-3 days. Hammond and Henry (1949) found the mean time interval ranged from 1.6 to 3 days, assuming the same female laid all eggs in a clutch in all cases. The first nest was started between May 2 and 9. Using the 1.6 to 3 day laying interval the last nest for this area was probably started about June 2. I found a nest, at Delta, about 40 miles west, which was started about July 13. Table 1 makes further comparisons with Hammond and Henry's (1949) data.

A nest found on June 6 had two eggs; on June 8 it had four eggs, and on June 10 there were still four eggs. On July 15 there were two young, one with its eyes still closed, and one pipped egg. If these three eggs represented three of the four original eggs, and there is no reason to assume otherwise, the last egg was laid on June 8 and pipped on July 15, giving an incubation period of at least 38 days. Balfour (1957) reports a 37-day incubation period, but for the first laid rather than the last laid. Sealy (1967) reports an incubation period of 41 days.

I observed copulation only once (on May 14) and because of meagerness of observations recorded in the literature I include the following description from my field notes.

> "—1345 I heard shrill calls—Keer-Keer at very distinct intervals, I looked from my tent and observed female to alight on post west of me, male flew in and alighted on her, she was upright but with head drooped, he was on her about four seconds and opened one wing to maintain balance, he then flew to a fence post nearby and perched there only a short time, female began preening, male flew up over area where female has been (presumably nest-site), female flew up and went to ground, male made four-five passes

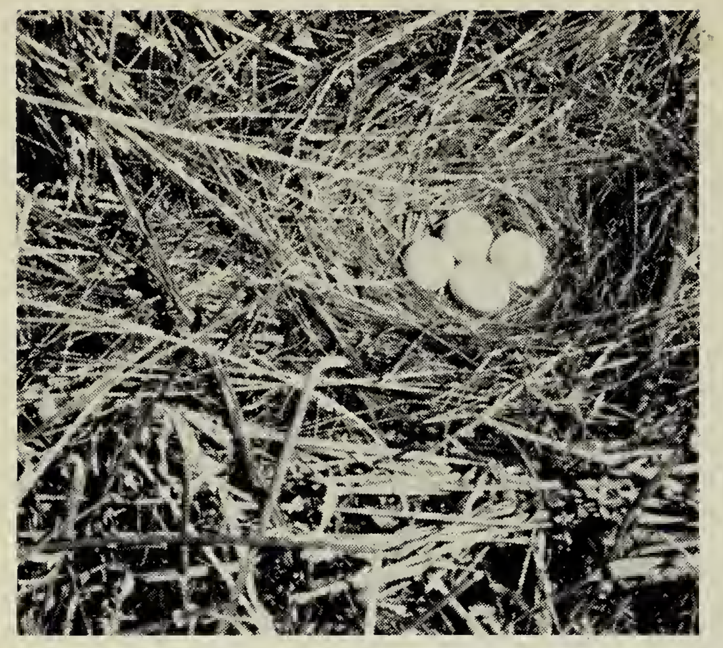


Fig. 2 Typical dry site Marsh Hawk nest in little more than a groundscrape lined with vegetation. Prominent plants in the vicinity were sweetclover *(Melilotus* sp.) and prickly lettuce *(Lectuca scariola).*

> over area making shallow dives but not turning over. He then flew back to a post near where copulation occurred and there remains perched at 1357."

Both of these birds were easily recognizable as they were naturally marked (the male in adult plumage had dropped tail feather number five on the left side, and the female had symmetrically lost a secondary from each side). The male was extremely vociferous and aggressive, protesting my presence anew each time I returned to my tent, pitched about 60 yards northeast of the nest site. I did not establish (definitely) the presence of a nest for this pair until May 16 when I flushed the same female off five eggs. The completed clutch size for this pair was seven. Hamerstrom (1969) observed copulation in a pair that already had two young on the wing. Balfour (1957) points out that the female solicits the male by "flattening herself on the ground and calling." I do not know how commonly copulation occurs in the Marsh Hawk off the ground; however, Hosking (1943) observed a Marsh-Harrier *(Circus aeruginosus)* pair copulating on a tree stump. Although I could not be certain that it was the female's "food call" which attracted my attention, it seems reasonable to assume it was.

Nestlings were banded where convenient (at only six nests) hence the following data (Table 2) is somewhat biased. Using Hamerstrom's (1969) criteria of differences in eye color I found an almost one to one, male to female, ratio in those young of the clutches where I banded and was able to record sex.

Urner (1925) first called attention to variation in nest construction of this species according to moisture conditions of the nest site. Sealy (1967) found the same condition. Of the 15 nests in my area, eight were on dry sites (Fig. 3) and seven were on wet sites (Fig. 4). Some on the latter sites were almost floating rafts.

The tendency for young Marsh Hawks to leave the nest before they can fly is well known (Hecht, 1951; Sealy, 1967). Thus it is interesting to note that this tendency was reduced in young of nests at wet sites (Fig 5).

Hecht (1951) gives a good summary of the literature on high density nesting of this species. Five nests in the southeast corner of the study area fit that situation. The term colonial or semi-colonial has been used to describe high density nesting. A colony is described by Thomson (1964) as a num-

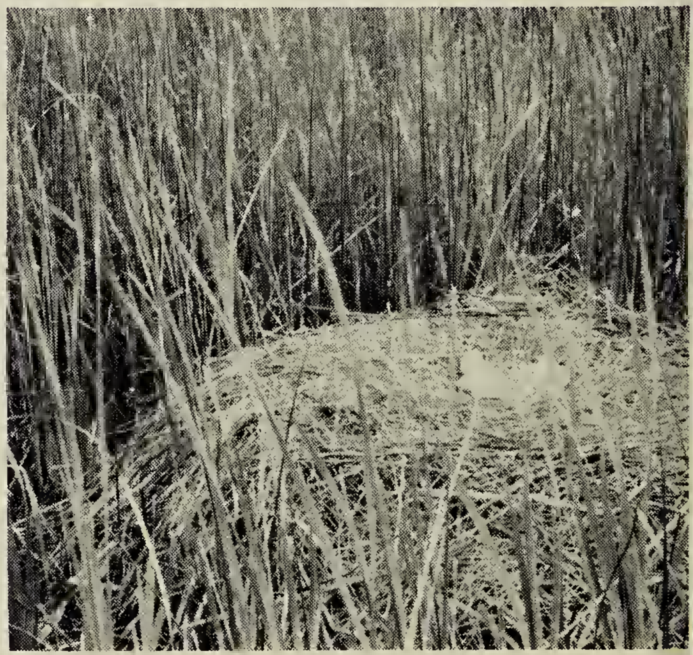


Fig. 3 Wet site Marsh Hawk nest is sometimes almost a raft. Dominant plants are cattail *(Typha latifolia)* and rush *(Juncus* sp.*)*

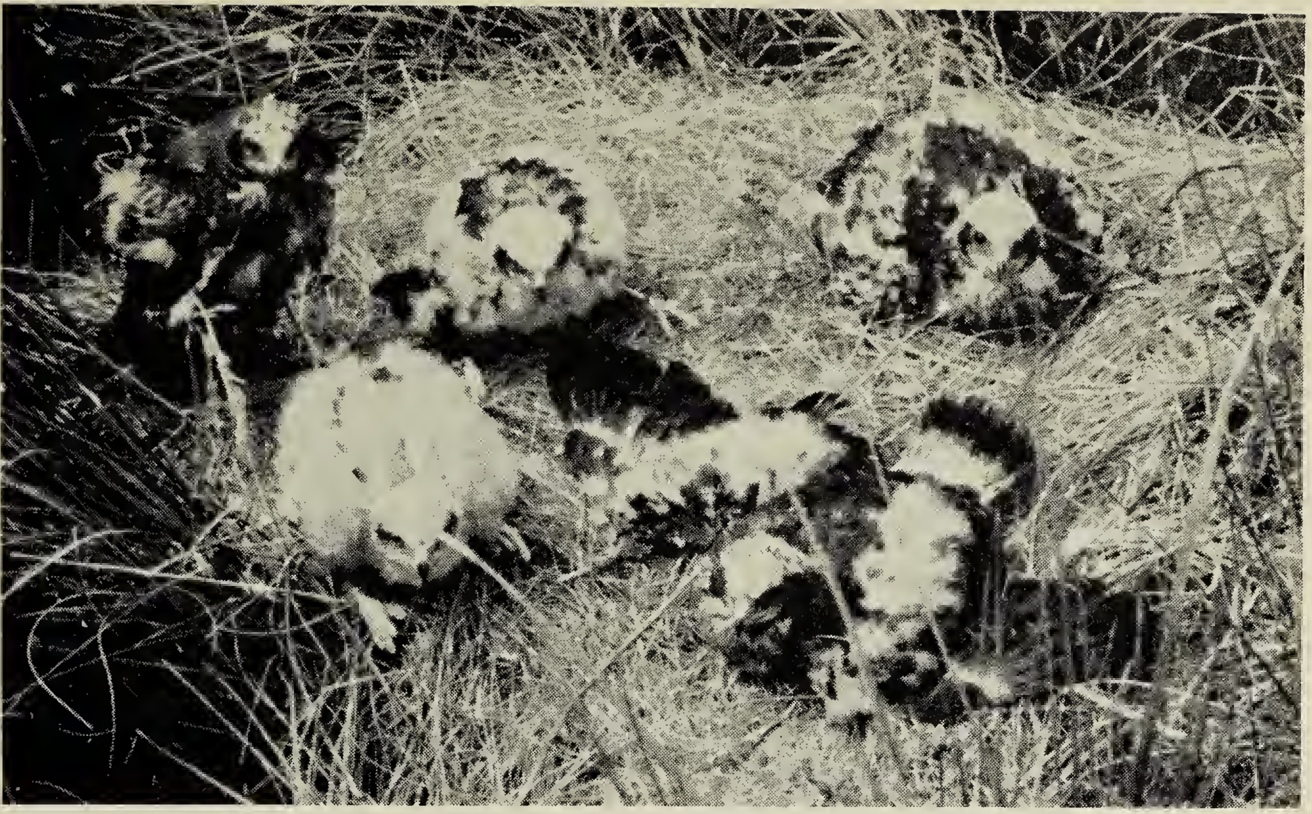


Fig. 4 Young Marsh Hawks are confined by water surrounding a wet-site nest. Young at a dry-site nest usually wandered into surrounding vegetation during banding operations.

ber of birds breeding gregariously and "vaguely including the location and the nests." Generally speaking territory size varies inversely with the tendency to nest colonially, therefore, the size of the territory might be used as an indication of strength of the drive to nest in a colony. In all but one instance the nest site was vigorously defended; however, hunting by the male was done outside of this vicinity. For the nests shown, the mean distance to the closest known nest was 1,382 feet with a range of 363 to 4,025 feet. These distances were measured on an air photo and the field distance extrapolated.

Table 2. Clutch size, sex ratio of young, age class of male parent, and nest site of six Marsh Hawk nests in Manitoba.

Eggs in clutch	Young banded male	female	Male	Nest site
6	3	2	Sub-adult	Dry
4	1	3	Adult	Dry
6	3 (1?)	2	Adult	Wet
6	3	3	Adult	Dry
?	3	2	Adult	Wet
?	2	2	?	Wet
	15-16	14-15		

Hecht (1951) and Hamerstrom (1969) both pointed out that polygamy (polygyny *senso stricto*) sometimes accompanies clumping of nests. Four of the five clumped nests in my area were maintained each by a different male as determined by both plumage and behavioural differences. I saw no evidence of polygyny.

Defensive behaviour at the nest varied between individuals but was consistent with individuals. Reaction by females ranged from flying off to a nearby perch and watching me without vocalizations or defensive behaviour to striking me. The behaviour of an unaggressive female was the same for six visits to the nest. One male was particularly defensive and would circle and call whenever I came within 200 yards of the nest. Comparing males to females among pairs, at one nest the female was more aggressive than the male; for example, she would come in much closer on dives and vocalized more. The exact reverse was true for another nest.

One wonders where the hawks that bred here in 1969 came from. Several may have been inexperienced breeders colonizing a new area (Hamerstrom, 1969, found few nestlings to return), however, of the 15 nests, there were only two nests at which I did not see a defending male, and of the 13 males for which I have records only two were in subadult plumage. There probably were not over two unlocated nests in the study area.

Casual observations of pellets in the field indicated that Marsh Hawks were feeding heavily on the abundant voles. Another factor which perhaps was important in causing them to nest in such concentrations was a fairly large area that was relatively undisturbed by agricultural activities.

There is some evidence that Marsh Hawks do not always return in subsequent years to their place of hatching. The third oldest bird from one nest (a male) banded on June 28, 1969 was recovered about mid-September 1970, some 210 miles northwest (the Kenville area) by L. Mychasiw. Hammond and Henry (1949) reported a direct recovery (i.e., bird recovered the same year as banded) of one bird (from 12 recoveries) having a northerly component in its direction of movement (800 miles west-northwest). None of the 24 recoveries reported by Houston (1968) had moved north from place of banding to place of recovery.

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THE RAILWAY — A HAZARD TO BIRDS

by **W. S. Richards**, Saskatoon

Probably everyone is aware of the incidence of bird mortality due to the collision of birds with vehicles on the highways and with fast-flying jet aeroplanes. Perhaps not so well known is the fact that birds also collide with trains, for dead birds along the railway right-of-way are usually unnoticed.

While working on the Canadian National Railway track I had been casually aware for some time of the dead birds that could be seen beside the track, but I did not think about the cause of their deaths until I became involved in snow-clearing operations during stormy winters. I help operate a railway snow-plow when required. Quite often we have had Gray Partridges fly up in front of the plow and when unable to clear they crash into the side or front of the plow. Partridges find clear spots on the track and gather there to feed on spilled grain from leaking boxcar doors. In March when Horned Larks are migrating, they too suffer a similar fate. They feed on weed and grass seeds of plants that stick out of the snow along the track. Sometimes at night they seem to be dazzled by the headlight's beam and cannot fly out of the way of the machine. When I was working at the Nutana round-house near the turntable about ten years ago, I recall counting seven dead Horned Larks draped on the front of a diesel locomotive. At other times I remember seeing Gray Partridge and Sharp-tailed Grouse caught in the grill-work and piping. Several years ago at South Saskatoon I found four dead Great Horned Owls within one-quarter of a mile. Other species whose death I attribute to collisions with trains are Mallard, Pintail, Blue-winged Teal, American Coot, Mourning Dove, Rock Dove, Black-billed Cuckoo, Black-billed Magpie, Common Crow, Robin, Mountain Bluebird, Yellow-headed Blackbird, Meadowlark and Snow Bunting and several unidentified birds, including a large gull, a small owl and a warbler. A dead racing pigeon found near the highway over-pass at the west end of Chappell yards had a band belonging to an Edmonton pigeon club.

Some birds nest in the nooks and crannies of railway cars which are in storage or seldom used. Barn Swallows fly in and out of broken windows in old bunkcars and often nest on any suitable ledge or rafter. Rock Doves also choose similar sites. House Sparrows find many places in which to build their nests and Robins are partial to cross-beams and channel iron. Suddenly they are displaced by the sudden switching of these cars and often the nests are dislodged, resulting in damage to eggs and young. A few years ago at the diesel shop in the Chappell yard in Saskatoon a pair of kingbirds nested in the arch-bars of a set of trucks and as they had to be used, someone relocated the nest in a similar site about 20 feet away. The brood was raised successfully. In the summer of 1968, while working at Humboldt, we stayed in a bunk car beside a caboose which had not been moved for some time. A pair of Robins had built their nest on a ledge above the caboose door and were busy feeding a youngster. One night both cars were moved about a quarter of a mile away and the young bird could be heard plaintively calling for its missing parents. Before we left in the morning I noticed an adult Robin perched on the roof looking down on the nest but we did not have time for further observations to establish whether this was the actual parent bird.

Another type of fatality I have noticed is "decapitation". Rock Doves commonly feed on grain from boxcars which have leaky doors and I have seen several birds' bodies with heads severed, owing to the unexpected switching of cars. I also saw this happen to a Common Nighthawk, a species which sometimes roosts on the rails in daytime.

There is, however, a "credit" side to the railway location. In many places the railway right-of-way is the last vestige of prairie left in some intensely cultivated area. It is therefore natural habitat for many of our grass sparrows and sometimes the home of the Burrowing Owl. Killdeers choose railway ballast for nesting sites despite passing trains. In dry years railway ditches sometimes retain enough water for a brood of ducks. Rock Doves and Cliff Swallows are at home under trestle and masonry bridges, and hawks, owls and eagles use telegraph poles for perches in treeless areas. Many dams and reservoirs which supplied the water tanks of by-gone days still exist and are used by waterfowl. Thus the railway supplies some encouragement for bird life as well as sometimes causing its destruction.

MILK RIVER VALLEY, ALBERTA, BRIEF EXPLORATIONS

by **Wayne W. Smith,** 8220 Elbow Drive, Calgary 9, Alberta

During the summer of 1971 I was employed in the Cypress Hills Provincial Park of Alberta. Since the Milk River is only about 60 miles away, I made five day-long excursions to the Milk River Valley south of Onefour and Manyberries, Alberta.

Some people are impressed by mountains. The Milk River Valley has much the same impressive aspect, being in effect an inverse mountain range. To me the Milk River Valley was close to a wilderness, though cattle grazing the area are damaging the land; human signs are few, being limited to scattered habitations, occasional fences and a few power lines. Still, the area is uniquely rugged and has an unusual flora and fauna. Several plant species, for example, yucca, are found nowhere else in Canada. I was enthralled by the area and believe it has great potential as a near-wilderness preserve. Perhaps my brief observations will encourage other naturalists to visit this site to appreciate better its values.

May 30 — Horned Larks, McCown's Longspurs and Chestnut-collared Longspurs were common along the way. Other species of interest were Long-billed Curlews, Upland Plovers and Lark Buntings. Because water was scarce, there were few ducks. Near the Cressday water reservoir, about 40 miles south of Elkwater, there were the usual prairie ducks, several Swainson's and Ferruginous hawks (one dark phase of each), one Prairie Falcon and several Marsh Hawks.

When one approaches a mountain range, the peaks are usually visible from afar and gradually loom larger on the horizon. The Milk River Valley was practically beneath our feet before we saw it, and instead of craning upwards we stood and stared down past our feet. As we approached the edge of the valley, we saw a female Pronghorn being stalked by some animal that we frightened away. I raced to the edge of the valley in time to see a Bobcat about 50 feet below. We stared at each other until my companion's voice sent it running off. In a matter of seconds it covered several hundred yards across a rocky draw. I was surprised to see that it was bright rusty-red, more so than pictured in field guides.

In the rocky coulees along the edge of the valley there were many prickly pear and pincushion cacti and other arid-land plants, notably greasewood, rabbit brush and bitterroot. Primroses were blooming and yuccas were present though scarce.

We found two Mule Deer resting in a grassy hollow and sighted one or two Yellow-bellied Marmots among a pile of boulders. Rock Wrens were within hearing at all times. These birds are supposed to have buffy tail corners, but those we saw all had complete buffy tail *bands*. Two abandoned Ferruginous Hawk eyries caught our attention and later we saw a Sage Grouse.

June 17—On this day the prairie adjacent to the Valley held many flowers. Within the Valley scarlet mallow was especially prominent. Besides the usual bird species I saw an unidentified falcon. It appeared to be a small Peregrine with a white breast and dark belly.

July 3—The first highlight was a small Prairie Rattlesnake crossing a gravel road north of the Valley. This was the first I had seen in Alberta. Upon climbing down the edge of the Valley I discovered at least four pairs of Lark Sparrows in one small area and flushed two Golden Eagles from an eyrie part way up the cliff.

On the flats on both sides of the Milk River sagebrush plants were small, but closer to the river they were taller and closer together. Along the edges of some poplar groves the sage was dense and over 12 feet high, due, no doubt, to increased moisture.

In the wooded areas four warblers were prevalent: Yellow Warbler, Yellowthroat, MacGillivray's Warbler and Yellow-breasted Chat. Here also were numerous Rufous-sided Towhees. The only woodpeckers were two flickers, one a Red-shafted Flicker. At the Valley edge I found a Nighthawk nest with two eggs.

In a scree or talus slide I searched for and found a scorpion, a rare invertebrate animal in these parts. I scooped it into an emptly film case and kept it alive for a week.

July 5 — Near where I had seen a rattlesnake on July 5 I saw another that measured three feet, seven inches in length.

At the Valley, Western Meadowlarks, Rock Wrens and Lark Sparrows provided a musical background while a Golden Eagle soared over the opposite side. After some time I noticed two swallows feeding in the air on the same level as myself. They appeared to be feeding young back in a crevice in the cliff. After a careful inspection I identified these as Violet-green Swallows, a species normally found breeding several hundred miles westward in the mountains.

[**Ed. Note**: For a nesting record in the Saskatchewan Cypress Hills see *Blue Jay* 27:144-145, 1969.]

Two Mule Deer were seen on the way to the river and besides the passerines noted on July 3 Black-capped Chickadees and Mountain Bluebirds were noted. I swam across the river and found at least six Bullock's Orioles in a grove of trees. Because I had left my binoculars on the other side, I had to get close to identify them, but they proved to be fearless and I was able to approach to within several feet of them.

On the steep slopes of the Valley I heard a cascading song that I recognized at once as a Canyon Wren, a bird I had heard in the Okanagan Valley in British Columbia in the spring. The tumbling melody of notes that make up its song could easily be distinguished from the Rock Wrens and nearby Sprague's Pipits. I searched for the songster for some hours but without success. I was disappointed not to actually see it, but was still elated to have identified it. The only previous occurrence of the Canyon Wren in Canada was in the Osoyoos Arid Biotic region of the southern Okanagan Valley.

A few miles north of the Valley I saw a pair of shorebirds that I believe were Mountain Plovers. I am not certain, however, for when I stopped to check they flew off across the prairie. This species has been previously recorded by Dr. J. Dewey Soper at Wildhorse, about 25 miles away (four on June 22, 1941), and by Cleve R. Wershler at Elkwater, about 45 miles away (two on June 12, 1966). (Dr. Soper also reported one near Bracken, Saskatchewan on June 5, 1939).

August 28 — There were a hundred ducks gathered on the Milk River, apparently massing for migration. Three species not previously seen in the area were: Sparrow Hawk, Tree Swallow and Robin. At the river I found a Brown Thrasher bathing along with several Rufous-sided Towhees.

WHITE-TAILED DEER IN NORTHERN SASKATCHEWAN

by **E. Otto Höhn,** University of Alberta, Edmonton, Alberta

White-tailed deer are reported by Beck (1958) as occurring in southern and central Saskatchewan, with Prince Albert National Park as the most northern locality named in connection with its distribution in the province. The publication cited gives a similar northern boundary for the Saskatchewan range of the mule deer, but in a later publication, the author (Beck, 1964) records the identification of deer tracks at two points on the south shore of Lake Athabasca, near Beaver Point, July 1960, and near William Point, July 1961. No deer were seen, but the tracks were attributed to mule deer as the most likely species in the area.

On July 26, 1971, I found two very clear deer tracks on the sandy shore of Lake Athabasca, a few miles west of the Alberta/Saskatchewan border. In view of the distribution maps of the white-tailed and mule deer in Hall and Kelson (1959) and those prepared for their range in Alberta by R. Webb in 1959 and reproduced in Soper's "Mammals of Alberta" (1964), I would also have interpreted these tracks as probably those of mule deer.

However, when I was at Uranium City a few days later, a taxi driver told me about two "jumping deer" (in my experience, a vernacular name for the white-tailed deer) he had seen crossing a road near the town earlier that month. Later Mr. J. A. Macauley, Conservation Officer at Uranium City wrote to me that on July 20, 1971, he saw two white-tailed deer beside the road at Ace Lake, five miles east of

Uranium City. His letter mentions the waving white tails of these deer and their graceful bounding gait when in full flight, both of which he contrasted with these features in mule deer. Additional points of evidence of the presence of deer, of one of the two species mentioned, in this area are a statement given to me by a local Indian in January 1970, that deer occurred there and a deer track I found in fresh snow on November 27, 1971, within a mile of Eldorado.

E. Kuyt has reported the occurrence of white-tailed deer about Fort Smith, Northwest Territories in 1966 and more recently (1971) he has noted further white-tailed deer and also mule deer sightings in that area.

To obtain relevant information about an area between Fort Smith and Uranium City, I wrote to the game warden at Fort Chipeweyan, Alberta. After enquiring from a number of trappers, Mr. H. E. Schaber reported (August 1971) that a Mr. F. Ladouceur told him he had shot two white-tailed deer in the Athabasca delta about 1963. He had kept their tails for later identification as these deer were strange to him. Apart from this, there were no deer sightings and only the rare finding of deer tracks near the Alberta/Saskatchewan boundary (presumably on the south shore of Lake Athabasca).

Webb's deer distribution maps referred to above show the mule deer as occurring sporadically throughout northeastern Alberta and white-tailed deer as found, sporadically, in that area only along the Athabasca river to Lake Athabasca. The recent Fort Chipeweyan information does not indicate any change from this.

Mule deer about Fort Smith do not indicate a marked change of the range of this species, but Kuyt's 1971 report suggests that they are now of more than sporadic occurrence there.

However, as Kuyt pointed out, the presence of white-tailed deer in the Fort Smith area constitutes a considerable northward extension of the species range and this applies equally to those seen about Uranium City.

Presumably, these deer reached the Fort Smith area by following the Slave River from the Athabasca delta. Those about Uranium City may have come from the same delta and followed the north shore of Lake Athabasca, but if so their apparent absence from the Fort Chipeweyan area, between these two points, is puzzling. An alternative approach to Uranium City is directly from the south. If long northward moves occur in winter, crossing the frozen lake would present no problem. However, I would imagine that northward range extensions result from journeys made in summer. The map shows that a crossing between Beaver Point on the south shore of Lake Athabasca and the islands off the tip of the long peninsula which extends into the lake southwestward from the vicinity of Uranium City involves, because of intervening Long Island, a maximal stretch of open water of only about eight miles. Deer can probably swim such a distance.

There are also some less spectulative questions raised by the foregoing. One is whether there are mule as well as whitetailed deer about Uranium City. Another is, which species of these deer occur on the south shore of Lake Athabasca.

Acknowledgment

My summer, 1971, journey to Lake Athabasca was supported by a grant from the Boreal Institute of the University of Alberta.

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SOME RECENT RECORDS OF ALBERTA MAMMALS[1]

by **Hugh C. Smith,** Provincial Museum and Archives of Alberta, Edmonton

The following records are of some of the lesser known Alberta mammals. The scarcity of these animals in Alberta or the difficulty in trapping them has made the delineation of their range rather vague.

WATER SHREW *(Sorex palustris)*

A specimen of a water shrew was forwarded to the Provincial Museum and Archives of Alberta by Dr. R. T. Worsley of Bashaw, Alberta. This specimen was captured on June 14, 1971 in the hospital at Bashaw. Because of the poor state of preservation no measurements were made, but the specimen is retained as a formalin specimen (Museum number Z71.46.1).

The range of the water shrew in Alberta, as outlined by Soper (1964), is along the mountains in the southwest, and north from a line just south of Edmonton to Lloydminster. This record from Bashaw represents a range extension of approximately 30 miles south and 60 miles east of the present known range.

KANGAROO RAT *(Dipodomys ordii)*

During the summer of 1971 Provincial Museum and Archives of Alberta staff found further evidence of this rodent on the south side of the South Saskatchewan River in Township 19, Range 2, West 4. Burrows were in sand banks along a prairie trail. As well, the tip of the tail of a kangaroo rat was found in a trap set at one of these burrows.

The occurrence of the kangaroo rat in this part of Alberta was well established (Smith and Hampson, 1969).

RACCOON *(Procyon lotor)*

In Alberta, raccoons are "rather rare and erratic" in their occurrence, but may be expected south of the Battle River and east of the foothills (Soper, 1964).

The following records are of interest in that four of them are outside this range:

April 1960. The Hudson's Bay Raw Fur department reported buying a large raccoon that had been trapped approximately 30 miles west of Edmonton, Alberta.

On April 25, 1961, the Medicine Hat News reported a raccoon caught in a beaver trap on the Ramsay Ranch 25 miles south of Walsh, Alberta.

On October 9, 1965, a raccoon was killed by a motor vehicle north and east of Clive, Alberta.

October, 1971. A male raccoon was shot at Bremner, Alberta. This animal weighed 21 pounds 11 ounces. The following measurements were taken: Length 970 mm., tail 234 mm., hind foot 122 mm., ear (from notch) 65 mm. The skeleton (Museum number 272.1.1) has been placed in the collections of the PMAA. Also in October 1971 a male raccoon was killed by a motor vehicle 45 miles north of Edmonton near Vimy, Alberta. The weight of this animal was approximately 21 pounds but because of its condition no measurements are available. However, the skin was salvaged and is in the PMAA collections as Museum number 271.91.1.

(I would like to thank W. Wishart, Research Biologist, Fish and Wildlife Branch, Department of Lands and Forests of Alberta for providing me with the first three of these raccoon records.)

WOLVERINE *(Gulo luscus)*

The reporting of sight records is a dubious practice. However, because of the paucity of records of the wolverine from southern Alberta, the following is submitted with due caution regarding validity.

On July 7, 1970 at Bovin Lake (S 19, T 3, R 1, W5) a wolverine was seen near the lake. This was reported to me by four students working for a geological survey party. They stated that when they rounded a bend in the road they saw the wolverine standing near the lake shore. As they approached the lake it retreated up a mountain path.

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[1] Natural History Contribution Number 9 of the Provincial Museum and Archives of Alberta.

The only other record of a wolverine in southern Alberta is that reported by Scotter (1964) for Cardston. Soper (1964) gives Banff as the southern limit of its range and Banfield (1950) does not include the wolverine in his survey of Waterton Lakes National Park.

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AN OBSERVATION OF APPARENT DEATH-FEIGNING BY A TOAD[1]

by **Martin K. McNicholl,** Department of Zoology, University of Manitoba, Winnipeg[2]

On July 5, 1970, while paddling a canoe along a ditch in the Delta Marsh, I noticed a small Canadian Toad *(Bufo hemiophrys)* swimming slowly alongside. I stopped and backed towards the toad, whereupon it swam rapidly for about eight inches and then suddenly flipped over, belly up, with hind-legs folded and fore-legs stretched beyond the head, as if feigning death (Fig. 1). Although I had seen hundreds of toads in the Marsh, none had ever before done this. Usually when encountered, toads either "froze", that is, remained belly down in the water with limbs extended or folded in the position in which they were encountered, or dived. In this case, the toad remained in the "dead" position for about 30 seconds, then righted itself and swam normally. When I again approached the toad, it this time "froze" and then began swimming rapidly. When further pursued, it dived, re-emerged about six inches away, and again "froze". I then picked it up to record its size. After being replaced in the water and again pursued, the toad flipped over onto its back and assumed the same posture described above. Additional attempts to elicit this behaviour, however, were unsuccessful.

A somewhat similar observation of apparent death-feigning in this species, also in the Delta area, was reported by Nero (1967), and accounts of death-feigning behaviour in other species of frogs and toads have been reported by Dickerson (1906:71, 87), Noble (1931:424), and Banta and Carl (1967). Nero (1967) thought such behaviour unusual in this species, and Banta and Carl (1967) referred to it as unusual in *Hyla versicolor*, the Gray Treefrog. Both Dickerson (1960:71) and Noble (1931:424), however, imply that death-feigning is easy to elicit in frogs and toads.

Clearly, more observations of this behaviour and the conditions under which it occurs are needed. Several features should be noted:

(1) *Size*: The toad reported by Nero (*op. cit.*) was "about an inch long", as was that observed by me. Other reports (Dickerson *op. cit.*; Noble *op. cit.*; Sutton, 1961) refer to death-feigning behaviour as occurring particularly in young individuals.

(2) *Length of time involved in feint*: Noble (*op. cit.*) stated that the feint "usually lasts only a few minutes, but it may be prolonged over an hour if disturbing sensory impressions are avoided." All other observations cited referred to short time periods (Dickerson *op. cit.*; Nero *op. cit.*; Banta and Carl *op. cit.*; this note).

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[1] Publication No. 15, University of Manitoba Field Station, Delta, Manitoba.

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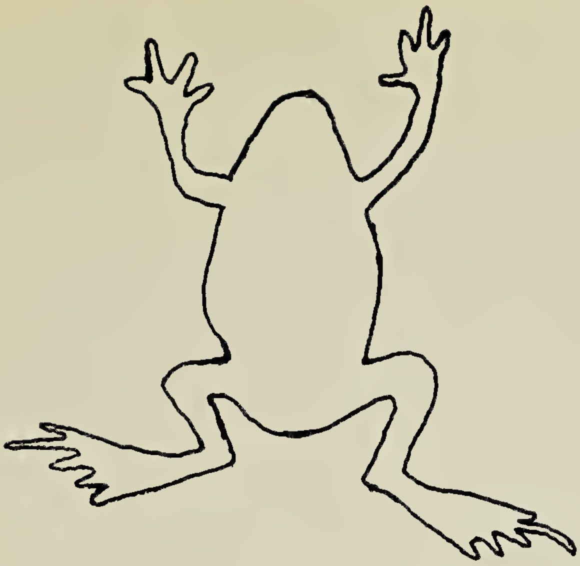

Fig. 1 Posture assumed during "death-feigning" by a toad at Delta, Manitoba, July 5, 1970.

(3) *Location*: My observation, and the four observations reported by Banta and Carl (*op. cit.*), were of toads in water. All other published observations appear to have taken place on land.

(4) *Eliciting stimulus*: In all reports the toad or frog exhibiting death-feigning behaviour was either pursued or touched. Most reports state that the individual was picked up or touched (Dickerson 1906:71, 87; Mangold *fide* Noble 1931:424; Noble*ibid; Banta* and Carl *op. cit.;* Nero *op. cit.*Q, but the toad of my initial observation had not been touched.

(5) *Position of limbs*: The positions of the limbs vary considerably during death-feigning. All observations or figures indicate that the hind-legs are folded as in Fig. 1 (see Dickerson 1906, fig. 79; Sutton, 1961; Banta and Carl, 1967), except for Nero's (1967) observation in which they "were extended backwards." In most reports the fore-limbs are folded to the sides or partially upwards at the sides (Dickerson 1906, fig. 79; Mangold *fide* Noble 1931, 424; Sutton 1961; Banta and Carl 1967). In contrast, Nero (1967) observed that the fore-limbs were extended backwards. In the present case they were extended forwards.

(6) *Eyes*: Sutton (1961) stated that the eyes were open during the death-feint, but both Nero (*op. cit.*) and I observed them to be closed. Dickerson's (*op. cit.* :87) statement that "the eyes open wide" on coming out of the death-feint may imply that they were closed or partly closed during the feint, and the eyes appear to be closed in her photo of *Bufo fowleri* in the feint (*op. cit.*: fig. 79).

The significance of this behaviour is unknown but it seems likely that it is escape behaviour, as suggested by Dickerson (*op. cit.*), Banta and Carl (*op. cit.*), and Nero (*op. cit.*). This would be effective particularly with predators unwilling or unable to take non-living prey. Observations of a Tiger Salamander *(Ambystoma tigrinum)* captured at Delta Marsh lend some support to this view. The salamander responded to earthworms or strips of meat only if they moved or were moved. Canadian Toads and Leopard Frogs (*Rana pipiens*) of small size were eagerly pursued and easily captured. However, one toad which escaped and died after being initially struck by the salamander was left uneaten. These observations are suggestive, but additional work is needed to confirm their significance.

I would like to thank Dr. Roger M. Evans and Dr. Robert W. Nero for assistance in preparing this note. Mr. Francis R. Cook offered useful comments, especially in pointing out the small size of individuals so far reported to exhibit death-feigning.

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ALGAL BLOOMS

by **M. V. S. Raju, J. E. Hines** and **Lois A. Pendlebury,**
Biology Deartment, University of Saskatchewan,
Regina, Saskatchewan.

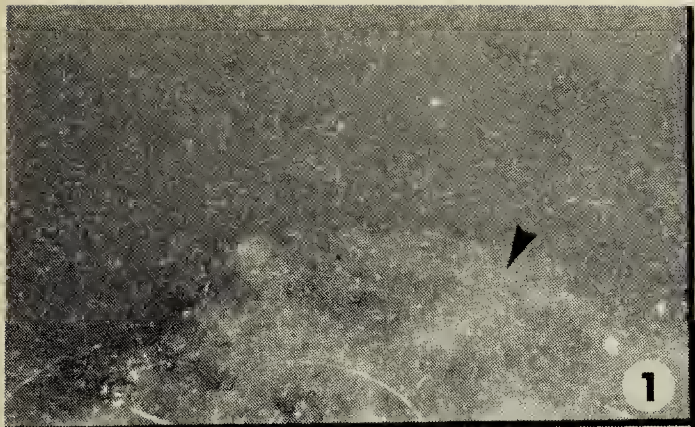
In lakes, rivers, and oceans certain algae multiply to such an extent that they form dense surface or sub-surface scums. Such scums or blooms, sometimes called phytoplankton "pulses", persist for a short time, often bringing about extensive fish kills. One of the first records of fish mortality is mentioned in the Bible as the first of the seven plagues of Egypt—"and all the water that was in the Nile turned to blood. And the fish in the Nile became foul, so that the Egyptians could not drink water from the Nile; and there was blood throughout all the land of Egypt." (Exodus VII, 20, 21).

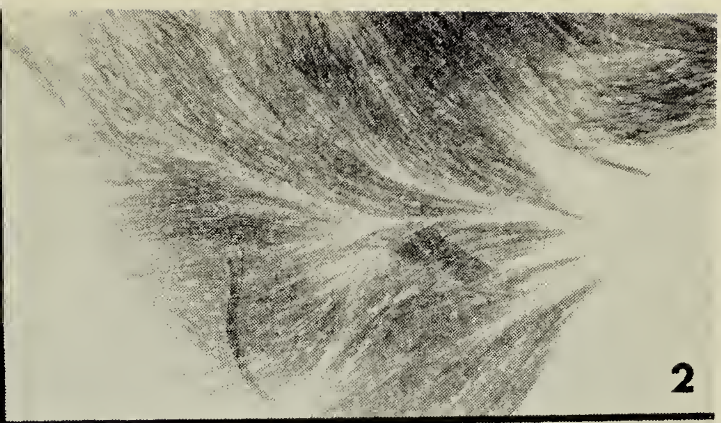
Many instances of algal blooms and their relationship with the mortality of fish and other animals have been observed in different parts of the world, from Australia to Japan, and Chile to Alaska (Brogersma - Sanders, 1948; Koob, 1971). Blooms in nature are produced by a variety of algae, not all of which are known to bring about detrimental effects. In the oceans, almost all mass fish kills by algae have been attributed to certain flagellates (Brogersma-Sanders, 1948; Florida Conservation News Vol. 6, p. 4-5, 1971). Inland, on the other hand, the blooms that cause harmful effects may be formed by many algae of which the blue-greens predominate.

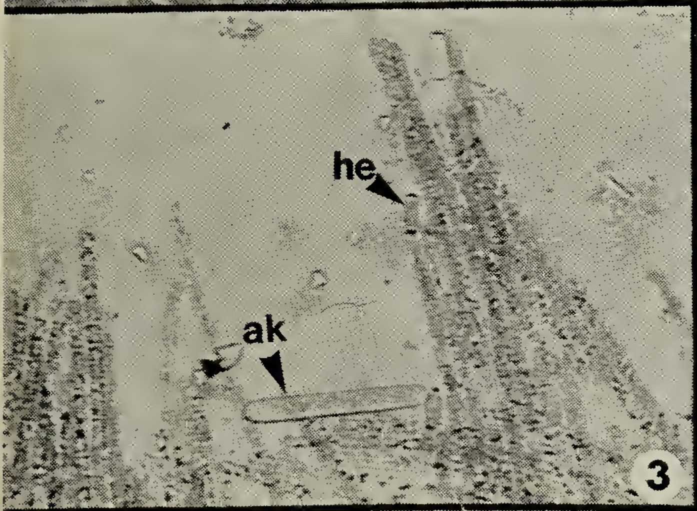
Toxic blue-green algal blooms may have harmful enough effects to kill many waterfowl, shore-birds, rodents and domestic animals as large as pigs and horses (Olson, 1964) and in some instances, certain types of gastro-intestinal disorders in man have been attributed to toxins produced by them (Schwimmer and Schwimmer, 1964). In southern Saskatchewan the blue-green algal blooms common in lakes and rivers are known to cause considerable damage to some fauna. In the Qu'Appelle lakes, many cases of mortality of a variety of animals have been related directly or indirectly to blue-green algal blooms (Hammer, 1968). Some researchers have been able to isolate toxic strains of blue-green algae and a few of the toxins produced by them have been identified (Gorham, 1960, 1962, 1964; Gorham *et al.* 1964).

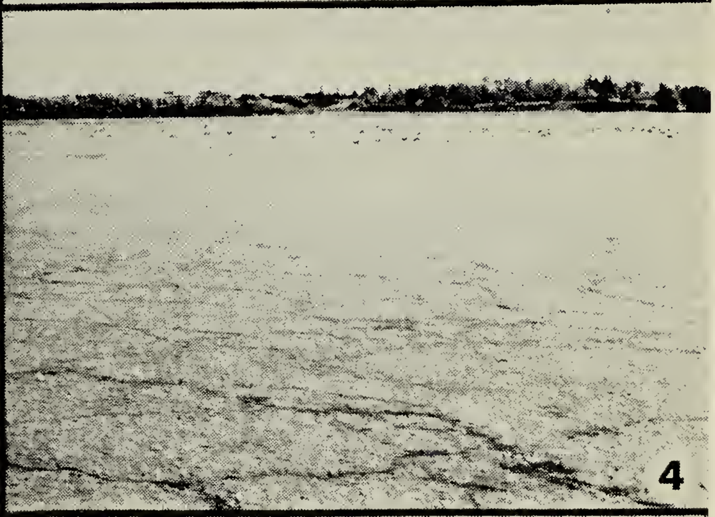
Appearance of algal blooms is a phenomenon associated with the natural eutrophication of lakes. Eutrophication is the aging process that all fresh water lakes undergo. "Young" lakes are typically cold water bodies high in oxygen content but low in nutrients, total living material, and the diversity of species present. Such relatively sterile lakes are said to be oligotrophic and are well typified by the lakes of northern Saskatchewan. As an oligotrophic lake ages, mineral nutrients and organic matter tend to accumulate from runoff; water temperature, species diversity, and the total amount of living material present increases. Lakes having these latter qualities are said to be eutrophied and are exemplified in Saskatchewan by the well-aged lakes of the Qu'Appelle river chain where algal blooms occur commonly.

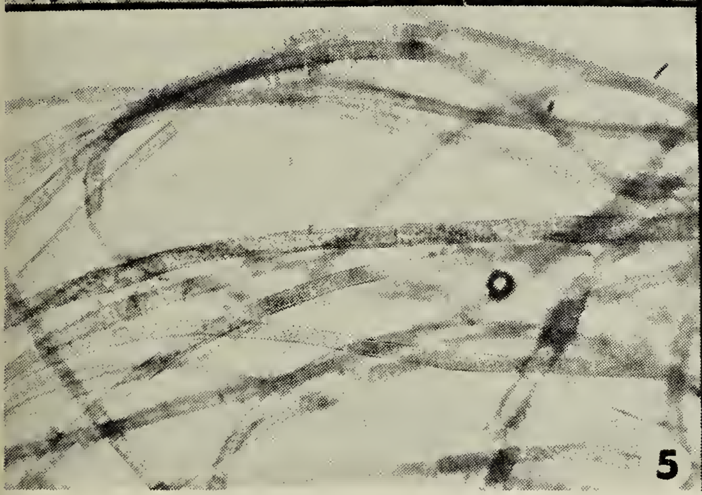
In an ecological survey of the Qu'Appelle lakes, Hammer (1967, 1968) has related the occurrence of algal blooms to a few environmental factors such as temperature, accumulation of phosphates, and the interactions of bloom-forming species. Although blooms occur as a natural phenomenon, their intensity can be compounded by the inevitable spring run-off which may carry in abnormal amounts of nutrients from agricultural fields, cattle feed lots, sewage treatment plants, etc. Good examples of the role of such human influence in the stimulation of algal blooms are the lakes of Amchitka Island, Alaska, where pollution from military camps constructed during World War II has, in a short period of time, changed oligotrophic lakes into











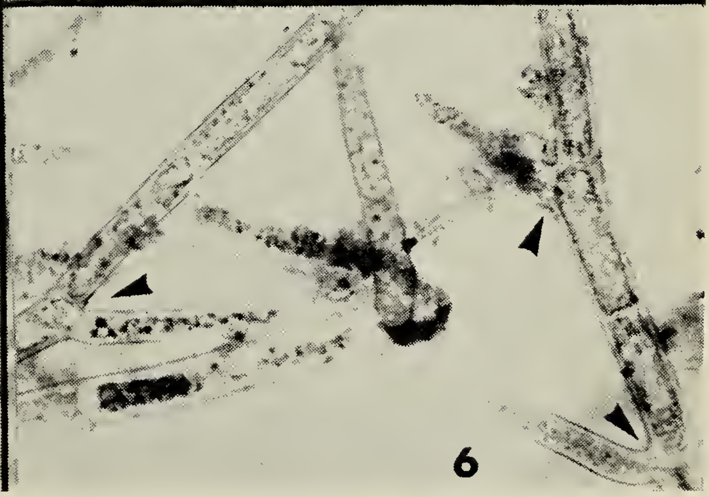


Fig. 1 Close-up picture of *Aphanizomenon* and *Spirogyra* in Wascana Lake. Arrow points at the slimy sub-surface of *Spirogyra*. Flakes of *Aphanizomenon* are visible everywhere.

Fig. 2 One of the flakes of *Aphanizomenon* as seen under microscope. Note bundles of trichomes or filaments. X 90.

Fig. 3 Enlarged view of the same to show the filaments, heterocysts (he) and akinetes (ak). X 765.

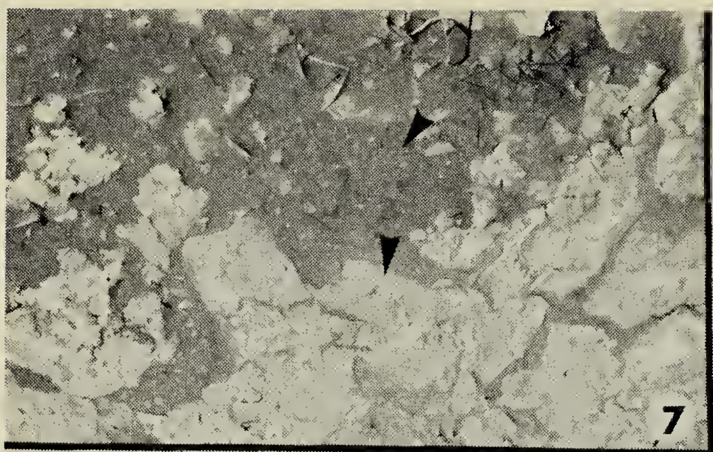
Fig. 4 Picture of surface scum of *Rhizoclonium*.

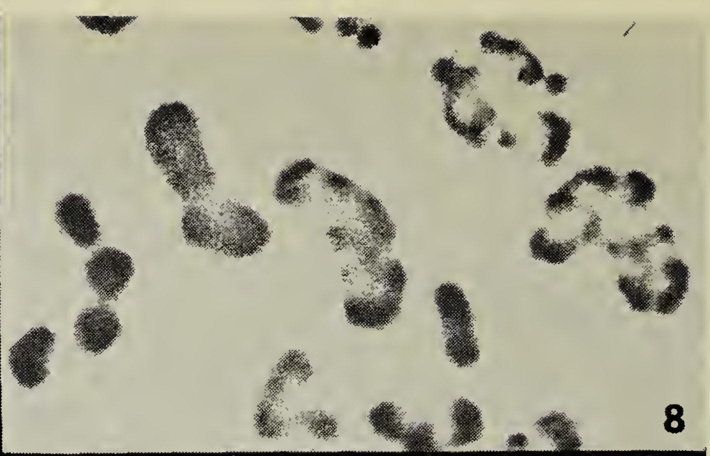
Fig. 5 A few filaments of *Rhizoclonium* under microscope. Note the absence of branching. X 225.

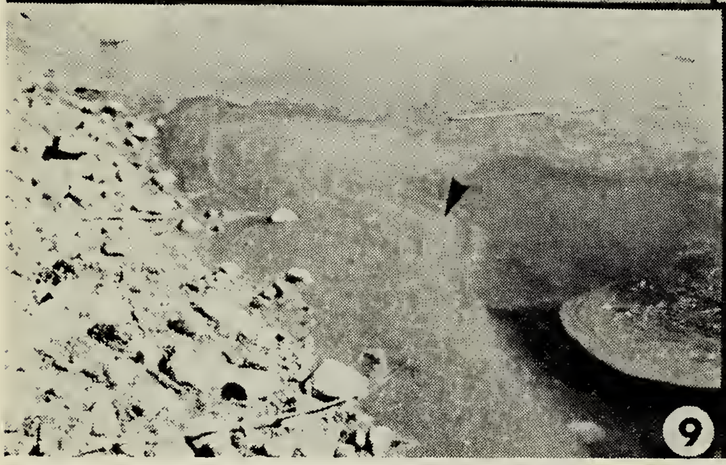
Fig. 6 Filaments of the same collected late in the season to show the mode of branching. Arrows indicate branching. X 765.

eutrophic ones supporting immense blooms of blue-green algae (Koob, 1971). In Lake Erie, the accumulation of nutrients from sewage, industrial wastes, and agricultural run-off has stimulated the growth of some of the most noxious types of algae and in the words of Dasmann (1968) turned Niagara Falls, which receives its water from Lake Erie, into "the nation's most spectacular sewer outfall."

While algal blooms form good indicators of pollution, they may themselves, under certain circumstances,







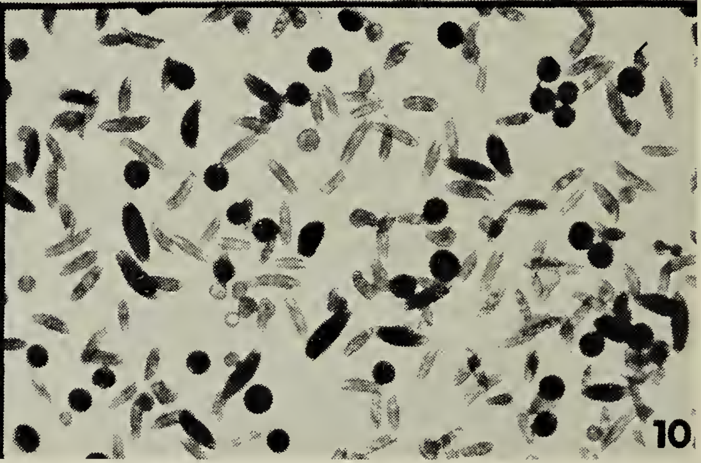


Fig. 7 Close-up picture of the surface scum of *Microcystis* (arrows). Dried flakes appear lighter.

Fig. 8 Same under microscope to show colonies. X 300.

Fig. 9 Surface scum of *Euglena.*

Fig. 10. *Euglena* cells under microscop. X-300.

become pollutants. Some algae have the unique capacity of accumulating and concentrating nutrients such as nitrates, phosphates, etc. When the algal cells die and disintegrate, these nutrients are released into the lakes which may then become overly enriched.

Algal blooms that are associated with pollution or eutrophication of lakes have been reported and the factors that control their development have to a certain extent been determined by using a wide variety of limnological techniques (Hammer, 1964, 1969; Warwick, 1967; see Odum, 1971). However, very little information is available with regard to the life histories of these algae. Information on how bloom-forming algae respond to a variety of environmental factors is wanting. Knowledge of the mechanisms of reproduction under natural conditions are amost totally lacking as is information on seasonal variation of the algae.

Algal Blooms of Wascana Lake

Some years ago, one of the authors undertook a project to take an inventory of the algae of Wascana Lake and to recognize the ones that formed blooms. In this connection, a checklist of the algae of Wascana Lake has recently been published (Raju, Young, and Hines, 1971). According to this checklist, only a few of the algae were found to form abundant blooms, thereby spoiling the aesthetic value of the lake and possibly endangering the lives of some domestic and wild animals frequenting the area. Some other algae were also abundant and showed possible bloom-forming tendency.

For the present purposes, the bloom forming algae of the Wascana Lake can be divided into three groups or divisions:

1. *Chlorophyta* (green algae), e.g. *Rhizoclonium* and *Spirogyra,* have chloroplasts with two major green pigments, chlorophyll *a* and *b*, which are essential for photosynthesis. *Rhizoclo-*

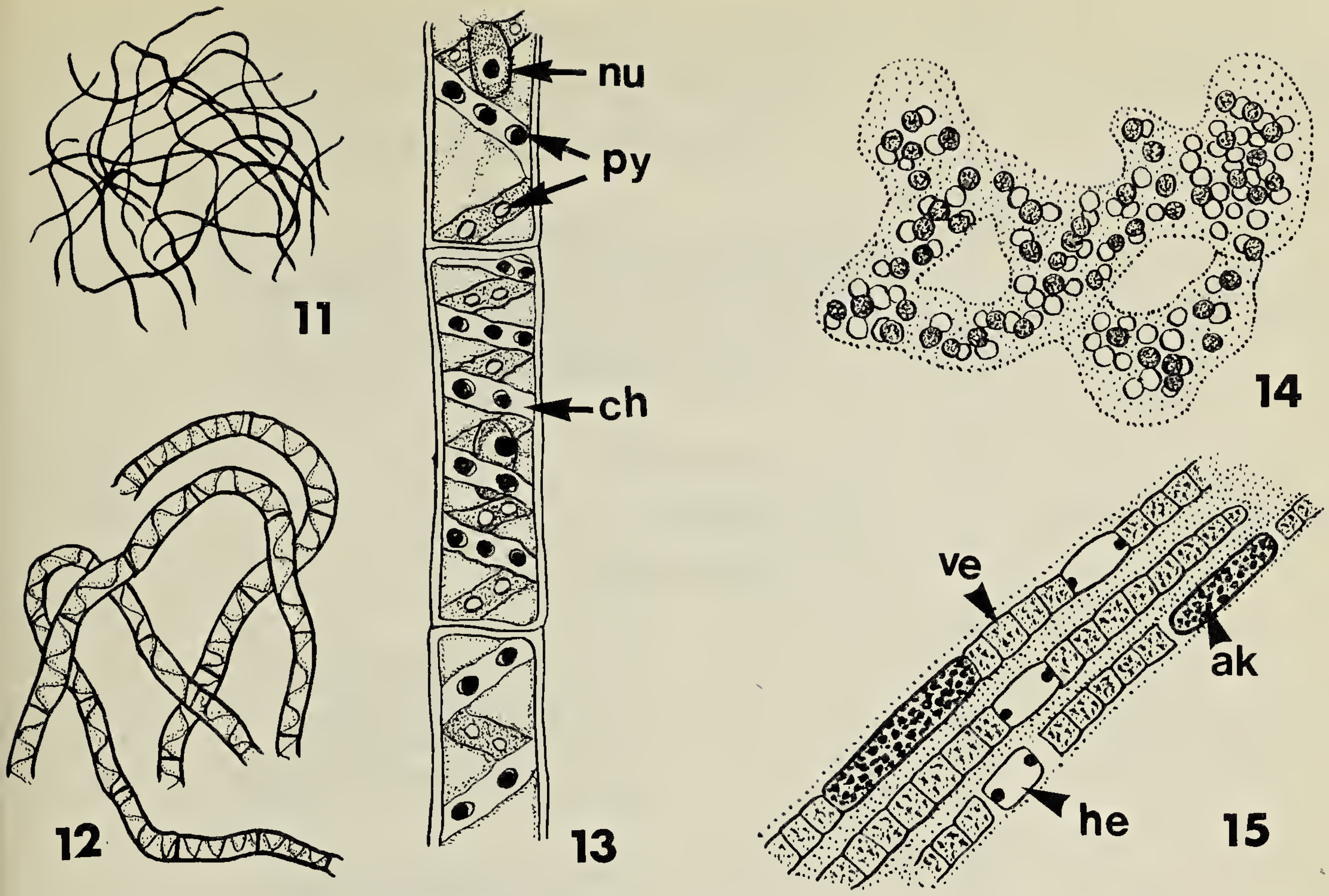


Fig. 11-15 Diagrammatic sketches of algae. Fig. 11: Unbranched filaments of *Spirogyra* tangled up. Fig. 12: Enlarged view of a few filaments showing cellular details. Note ribbon-shaped helical chloroplast (ch) with pyrenoids (py) and nucleus (nu). Fig. 14: enlarged diagram of a colony of *Microcystis* of the type seen in Fig. 8. Note mucilaginous matrix in which many cells are embedded. Fig. 15: A bundle of filaments or trichomes of *Aphanizomenon* showing akinetes (ak), heterocysts (he) and vegetative cells (ve).

nium is a filamentous form with little or no branching (Figure 5) which may form branches late in the season (Fig. 6). The filaments of *Spirogyra* form a dense slimy mass (Fig. 1) and they are unbranched (Fig. 11, 12). The cells of *Spirogyra* contain spirally arranged ribbon-shaped chloroplasts which may vary in number. In the present form, however, the cells have one chloroplast per cell (Fig. 13).

2. *Cyanophyta* (blue-green algae) do not contain structures equivalent to chloroplasts. The pigment is spread throughout the cell in the form of fine granules. These granules are known to contain major pigments, chlorophyll *a* (green), c-phycocyanin (blue) and c-phycoerythrin (red). These pigments together give a blue-green or sometimes red coloration. The ones that form blooms in Wascana Lake are blue-green. e.g. *Microcystis* and *Aphanizomenon*. *Microcystis* is a unicellular form dividing rapidly to hundreds and thousands of cells which remain embedded in a common mass of mucilage. Such colonies are microscopic and show a variety of morphological forms (Fig. 7, 8, 14). *Aphanizomenon* is a filamentous form surrounded by slimy mucilage. Several filaments are held together in a mucilaginous matrix to form very small flakes which are visible to the naked eye (Fig 1). These flakes under higher magnification show a variety of forms (Fig. 2). The unbranched filaments, commonly called trichomes, are made up of minute uniform-size cells. These are the vegetative cells. At certain stages in the life cycle some of these minute cells become modified to form heterocysts and akinetes (Fig. 3, 15). The heterocyst cells under a microscope appear optically empty and are known to con-

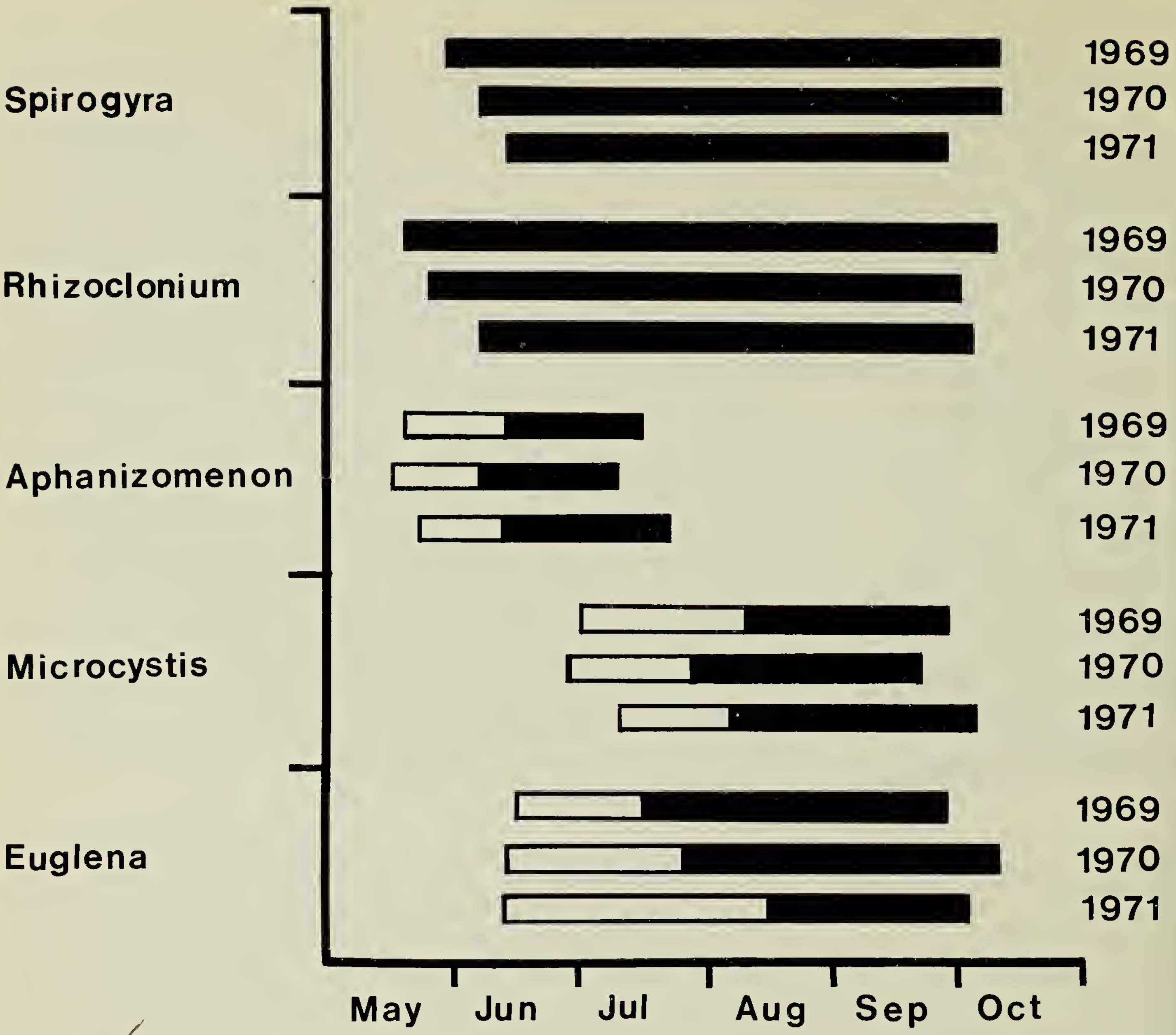


Fig. 16 Seasonal changes in the morphology of populations of algae that form blooms in Wascana Lake. Solid bar indicates bloom period of the algae. Open bar shows the occurrences of the alga.

tain special enzymes (Stewart, Haystead and Pearson, 1969). These cells are reported to be the sites where the nitrogen in the atmosphere is fixed into the cell. The akinetes, on the other hand, are large optically dense cells with abundant storage material. These cells, after they are detached from the filament, can over-winter and germinate in the following spring thus forming new filaments.

3. *Euglenophyta* (Euglenoids or flagellates) have chloroplasts with green pigments, chlorophyll *a* and *b*. Some carotenoid pigments are present which under certain circumstances become so abundant that cells appear red in color (Raju, 1970). These algae are generally solitary and can swim around with the help of a whip-like flagellum (Fig. 10) and at certain times of the season the cells may aggregate to form a surface scum or bloom, e.g. *Euglena*.

In Wascana Lake, only 5 genera (2 green, 2 blue-green and one flagellate) formed blooms. For each of the genera, the time of origin of the bloom and the length of its persistence varied from year to year (Fig. 16). The pattern of succession of the blooms was fairly consistent during the observation period.

The filamentous, branched, green alga, *Rhizoclonium* (Fig. 5, 6) appeared early in the growing season (Fig. 16). This formed a persistent green or yellowish - green surface "mass" and died out completely in autumn. *Spirogyra*, another green alga was correspondingly similar to *Rhizoclonium* although not so abundant as the latter. It formed a surface or subsurface bloom in some areas of the lake in late summer and in autumn. The blue-green unbranched filamentous species. *Aphanizomenon* (Fig. 1 2) appeared early in the spring and formed an extensive sub-surface bloom in the lake. It lasted until about the middle of July (Fig. 16). The algal filaments were held together by slimy material and appeared like flakes. These flakes showed a variety of morphological patterns which could be recognized under the microscope (Fig. 2). Dense aggregation of such flakes in some areas corresponded to the oft-described thick "pea soup." Another blue-green, *Microcystis* (Fig. 7, 8) appeared very late in the summer (Fig. 16) when water temperature was high. It persisted until the early part of autumn. During its growth the colonies showed a variety of forms and very often it was difficult to identify the species. The flagellate, *Euglena*, bloomed along with *Microcystis*. Although *Euglena* cells were observed in spring, they did not bloom until late July (Fig. 16).

The succession of blooms, particularly of blue-green algae, are known to be related to factors such as temperature, nutrient concentrations, etc. (Hammer, 1964). In general, the phytoplanktonic blooms in temperate countries are known to appear in spring and autumn and they are reported to be related to nutrients (Odum, 1971). High concentrations of nutrients in the winter and their subsequent depletion in the spring may be correlated with algal blooms in the spring. The autumn algal blooms are due to the stimulatory effect of nutrients accumulated during the summer by the disintegration of spring blooms. Whatever may be the correlative factors, the mechanisms of blooming of some algae and the relationship between bloom-forming algae and their reproductive cycles are not clear. Attempts are being made to gain a better insight into the mechanisms of bloom formations in certain algae and to determine the role of environmental factors on the bloom-forming capacity of the algae.

Acknowledgment

Part of the work on this study was carried out with the help of a summer scholarship awarded to Mr. J .E. Hines under the Student Temporary Employment Program (1971) of the University of Saskatchewan, Regina, and this help is gratefully acknowledged.

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The Blue Jay Bookshelf

HIGH ARCTIC. An expedition to the unspoiled North. 1971. By George Miksch Sutton. Paul S. Eriksson, Inc., New York. Published simultaneously in Canada by Fitzhenry and Whiteside Ltd., Toronto. 116 pp. Illus. $14.95.

The designation "High Arctic" in itself stirs the imagination. Add the visual impact of the two-page spread of snowy wastes across which George Sutton has pictured four muskoxen travelling to their feeding grounds on Bathurst Island, and you have begun to catch the flavour of this work. The four muskoxen in fact provide a visual motif for Sutton's book. Reduced to simple black-and-white silhouette, they reappear several times against the wide white margin of a page of text. Four other colour plates are used in the same way — the water colour paintings of Greater Snow Geese, of King Eiders, of Brant, and of the Long-tailed Jaeger. Through the use of these black-and-white motifs, the author-artist insists upon the unique character of the icelands of our Canadian North which his five large paintings are intended to suggest. There are seven more colour plates by the artist, and a portfolio of full-colour reproductions of the eleven can be purchased, while the supply lasts, for $14.95. In addition to the paintings and sketches by the author, there is also a series of photographs taken in the North by David F. Parmalee, Stewart D. MacDonald, David R. Gray and Philip Taylor, members of the party that Sutton joined on Bathurst Island. The descriptive legend for each photograph is imaginatively accompanied by a quotation from the text.

To my mind, Sutton's book is primarily an art book. Its large format, the two-page panorama of the Arctic presented by almost every painting, the fine white paper on which the text is set, with great open margins broken only by the severe black-and-white sketches, are visually very effective. Even the photographs, such as those of the Epstein-like monoliths and the old bull muskox or the young arctic hare, share this artistic quality, although there are a few which are less effective and seem to clutter the page.

When Sutton puts aside his brush to take up the pen, it is again with an artist's eye for concrete and striking detail that he recounts his experiences and describes the rare birds and mammals of the High Arctic; muskoxen, Peary's caribou, the Barren Grounds wolf, lemmings, jaegers, rock ptarmigan, ivory gulls, purple sandpipers, and snow owls with *horns*.

The dual nature of this book is a direct result of the double role played by Sutton, as artist and ornithologist, on the expedition to Bathurst Island which he was invited by the National Museum of Natural Sciences in Ottawa to join in the spring of 1969, and of which he gives us his account here. As a member of the party, he was expected to do some painting, but also to study the behaviour, life history and distribution of arctic shorebirds.

Although it is only a part of the larger whole (taking up no more than 66 short pages), the written story of Sutton's experiences on this "expedition to the unspoiled north" (the subtitle used by Sutton) cannot help being an exciting one. Sutton had previously taken many trips into the north, but only to the southern islands of the Canadian Arctic Archipelago which men who have lived along the shores of the North Polar Mediterranean lump scornfully with the rest of North America as "the banana belt." It was with considerable enthusiasm, therefore, that he accepted the invitation to go to Cornwallis, Bathurst, Ellesmere, and other really far northern islands.

From Resolute on Cornwallis Island, Sutton flew to Bathurst on June 7 in a badly crowded Otter with other members of the party, their luggage and supplies, and a friendly husky, Tuka. Camp was along the eastern side of the Island on a snow-covered ridge inland from Goodsir Inlet, and temporary "Parcoll" huts were set up as accommodation. This was also Sutton's studio where he worked on paintings from sketches made in the field. His younger graduate - student companions were engaged variously in studying the muskoxen (which so stirred Sutton's imagination because their lives were "won against such incredible odds"), snowy owls, the courtship behaviour of the rock ptarmigan, sanderlings, and so on. At the time of Sutton's arrival, everyone was eagerly watching for the first saxifrage bloom and the first purple sandpipers, for even on this date in June, spring had not yet come to the High Arctic. By such imaginative details, Sutton makes us appreciate the difference in plant and animal life between those latitudes and ours. The excitement of scientific discovery is also conveyed — as, for example, when buff-breasted sandpipers, not on the official bird list for Bathurst Island, are seen, or when ivory gulls are finally spotted (after a long search for them farther north) upon return to Resolute. Sutton's comments also reflect his scientific curiosity, as he puzzles over the explanation for the "absences of hares from an area in one summer day and abundances of hares in a not-very-far-removed area on the very next day", or the reason for the strange failure to see a single raven or falcon, although they had travelled by plane beyond Bathurst Island to Eureka on Ellesmere and across Axel Heiberg Island to Merghen Island. But the viewpoint of the scientist, eager to record facts, never dominates Sutton's account of the expedition. He has the general reader constantly in mind, and makes his appeal to him through concrete descriptions and humanly-warming anecdotes. I think here, for example, of Sutton's vivid picture of himself trying to fend off the over-friendly advances of three exuberant huskies that "boiled around" his feet while he yelled "Stay home!" Or of his description of his own reaction to the blood-chilling story told by his camp companion of the killing of a bull muskox by "Old Bloodface", the Barren Grounds wolf. It is evident that Sutton has the gift of a raconteur, as well as of an artist. — *Margaret Belcher*, Regina.

THE GOOD, GOOD EARTH. 1971. The MacMillan Co. of Canada, Ltd., 70 Bond St., Toronto 2. 168 pp. Price $6.95; paper back $3.95.

"The Authors of this book are eminent scientists who are deeply concerned about the continual erosion of our environment." So reads part of the jacket advertisement, and one has only to read the book to see why this concern should be felt by all Canadians.

There is no time to be lost, the authors say, and we cannot afford to waste time belabouring the "other fellow" for his sins, for this is corporate sin, if not of commission, then of omission on the part of those of us who are silent. The subject of environmental erosion is too big, too vital for anything less than concerted action on the widest possible front.

Big Business has closed ranks to defend its ways. It pays a certain lip-service to remedial pollution measures (though little to avoidance of root causes) but only so long as such measures interfere as little as possible with profit making. Their principal protagonists appear to be those biologists who are in the pay of the industrialists, who soft pedal the ecological evils resulting from industrial raping of our country—and the world.

We would do well to beware of the soothing syrup offered to us by way of articles, radio talks and glossy coloured advertisements showing sleek Angus cattle feeding peaceably in the shadow of great oil refineries. The fact that the oil companies can pay out so much for this counter-propaganda is in itself a straw which indicates there is something rotten. It is time, therefore, that everybody look at the pollution problem coolly but realistically, and then pull together — not only the ecologists, economists, biologists, social planners *and* industrialists, but also every common or garden citizen.

In order to assess the real facts we — the public as well as the government — can no longer afford to listen only to the comforting words of the engineers and industrial planners; we *must* listen as carefully to the independent ecologists who have no axe to grind but who have the good of our country and its future in mind. If we do not give these men a hearing, if we continue to speak of them as "cranks," "fanatics" and "Jeremiahs", then we shall be compounding the problem and be too late to take necessary action. For too long have we thought of "growth" as "progress", for too long have we made a god of industry, and if we continue to do so it will be at our peril, and the peril of future generations.

There is so much that is quotable in this book that one is tempted to crib whole sentences, but we remember that the reviewer's job is not to do that but simply to express an opinion as to the validity and readability of a book.

Therefore I shall say that at its price, this book is one that we can hardly afford *not* to read, unless we are content to remain in ignorance of the rapidity with which our resources —especially our resources of fossil energy (oil, gas, etc.) — are being exhausted. This, together with our extravagant wastage of wildlife, and worse, of our precious soil, can and probably will bring about such drastic changes as will amount to the decay of our civilization. (It would be a dreadful shock to many people if they found that oil resources had become so meagre in supply that oil had to be rationed and fed out only to basic or most important industries. No more wheeling out the family car to take in the Calgary Stampede!)

Finally, while in the nature of things certain technical words are bound to occur in a book of this kind, I must congratulate the authors on a very readable piece of work; I feel sure that anyone should be able to understand the urgent message it contains. For my part, once I started to read it, I could not put it down.

So buy it, and if you can't do that, beg it; or as a last resort steal it. But read it.—*R. D. Symons,* Silton.

STILL THE WIND BLOWS. 1971. By R. D. Symons, Western Producer Prairie Books, Saskatoon. 283 pp. illus.

The fictional hero of this novel, set in the Canadian North-West and Saskatchewan in the period 1860-1916, is John Curtis, son of an American trapper, raised by a Cree foster mother, who is a participant in the notable events of the period, including the North-West Rebellion, and rises to the rank of Superintendent in the Royal North-West Mounted Police. The author, Dr. R. D. Symons of Silton, in the past seven years has published *Many Trails, Hours and the Birds,* and *The Broken Snare,* three books well-known to readers of the *Blue Jay.* This novel reflects the author's long acquaintance and sympathy with the native peoples. The treatment of such episodes as the Rebellion, the Battle of Wounded Knee, and the repatriation of Canadian Indians following the latter event, illuminates the Indian position. Despite the mutual respect which featured the relationship between the early Mounted Police and the Indians, misunderstanding had arisen between Indians and incoming settlers, direct contacts became infrequent; hence, "still brother sees brother as in a glass darkly," "still the wind blows." Dr. Symons' book will help to moderate the wind.

While this theme underlies the story, it should be enjoyed, too, for what it is, a well-written and exciting novel. The author's excellent drawings help to recreate the atmosphere of the time. The characters are believable and the interpretation of historical events, for the most part, valid. The account of the Cypress Hills massacre (pp. 15-17, 271) is least satisfactory. It is misdated (it occurred in 1873) and the participants could have been identified with more certainty. The perpetrators included Canadians as well as Americans, the Indians were surely the Assiniboine band of Chief Little Soldier, and there was more than one white trader on the scene. The summary of the trials and convictions following the Rebellion (pp. 162-163) is incomplete. The author may be overly kind to Judge Richardson, "who did his best." In his charges to the juries, Richardson tended to do his best to secure convictions, but his sentences could be regarded as humane. The statement that "the chiefs might well have been hanged" is misleading in reference to these trials since the Crown at the outset decided to charge them only with treason-felony, for which the punishment was imprisonment, not death. That White Cap was "not punished by the authorities" (p. 277) is correct, but in fact he was arrested and held in custody for some considerable time until acquitted at his trial in September, 1885.

One incidental reference which would merit amendment is to the long stacks of buffalo bones piled up "by the railway track at Wascana—Pile of Bones—which had given that original name to what was now Regina" (p. 79). The bones had accumulated and were piled up at the Old Crossing many years before there was a railway track; they were noted and the place so-called by travellers as early as the 1850's. The spelling "Northwest Territories," adopted throughout by the publisher, is regrettable, since "North-West Territories" was the almost universal form. Moreover, it was the official spelling in acts of Parliament, government reports, and map nomenclature.

Dr. Symons concludes his introduction with the "fervent hope that one day the terms 'rebel Crees,' now embossed on the cairn marking the site of the Battle of Cut Knife Hill, may be removed forever." The plaque was revised and replaced, in 1952. All readers of this novel will be glad to learn of that action, and to know, as well, that plaques commemorating Poundmaker and Big Bear will be erected by the federal government, following recent recommendations of the Historic Sites and Monuments Board of Canada.—*A. R. Turner*, Provincial Archivist, Regina.

CANADIAN WILDLIFE SERVICE '71. 1971. By the Canadian Wildlife Service, Department of the Environment. Catalogue No. R66-3771. Information Canada, Ottawa. $1.00.

"Canadian Wildlife Service '71" is a status report of the various activities of the Canadian Wildlife Service. The varied nature of the reports, from discussions of improvements of potholes for waterfowl nesting to the work of the public information services, illustrates well the maturation of wildlife agencies to groups concerned with all aspects of the natural world.

Most of the booklet consists of a series of short reports of specific research projects being undertaken throughout Canada. These are arranged by area of concentration, such as migratory birds, land management, mammals, limnology and ecology. Short sections on pathology, toxic chemicals, biometry, interpretation and information services are written as compilations of the work being done within that specific field in Canada.

Of special interest to the people of Saskatchewan will be reports on western waterfowl populations and the management and ecology of waterfowl habitats in the prairies. Also interesting is the report on various toxic chemicals which reflects the growing concern of governmental agencies with the effects of all chemicals which are possible or proven poisons.

The reports are of necessity, very brief and only indicate the nature of the projects without including very much specific data. The booklet is illustrated with a number of handsome photographs of research areas and animals and of the researchers at work. —*D. M. Secoy*, Regina.

THE GREAT WHITE BEARS. 1971. By Robert W. Nero, Department of Mines, Resources and Environmental Management, Winnipeg, Manitoba.

It is a far cry from the simple pamphlets that government departments used to issue to the current glossy-paper productions embellished by handsome colour plates and professional photography. *The Great White Bears* is cast in the new mould, like the recent Canadian Wildlife Service publications. Such a production is necessarily very expensive; in this one, for example, six colour plates are used in a 16-page booklet. The theory appears to be that the expense is justified, since this is the only way to create an interest in wildlife in a public conditioned to glossy magazines.

This wildlife bulletin should also be capable of creating interest in photography as an art form, for the bears are imaginatively and dramatically portrayed. The effectiveness of the photographs is enhanced by the layout of the pages. Photo captions are placed in the wide margin allowed on each page (except on page 13, where a chart runs awkwardly across the bottom of the page).

I am not familiar with the previous publications of the Manitoba Department of Mines, Resources and Environmental Management, of which W. Winston Nair is now Deputy Minister. However, I see in the format of this one the hand of Dr. Robert W. Nero, who in his previous museum career was keenly interested in display techniques. The text, of course, is also by Dr. Nero, who has given a good summary of what is known of the behaviour and distribution of the great ice bear. None of this material is new, and none of it results from Dr. Nero's own studies, so it is to be assumed that the Department authorized the preparation of this bulletin chiefly because the Polar Bear is a conspicuous mammal of the Hudson Bay coast of Manitoba, with one of the world's largest denning areas located about 40 miles south of Churchill. As such, the booklet provides interesting and authentic material for natural science classes in the schools and for the general reader, in addition to being something that anyone with a photographer's eye for an artistic subject will be glad just to look at.

No information is given as to whether the booklet can be obtained from the Department, or at what price. —*Margaret Belcher*, Regina.

JUST A BUNCH OF TREES. 1970. Text by H. A. Cunningham. Published by the Province of Manitoba, Department of Mines, Resources and Environment Management; Conservation Extension Branch, 139 Tuxedo Blvd., Winnipeg 29. 31 pp. Free.

"Lots of people think a forest is nothing but a bunch of trees, and they really mean it. In fact, the forest is a community of magnificent complexity. Living, organic and inorganic components are precisely arranged and controlled to create a kind of superbeing that breathes, grows, changes with age, and suffers ills. When abused beyond toleration, it dies." (Foreword page 3.)

This publication is an introductory ecological description of the forest communities in Manitoba. The four communities described cover a large percentage of Manitoba's total area, and emphasize the diversity and interdependence of living things. The reader is made aware of the limitations of the forest community by physical factors such as soil type, temperature, light, rainfall, humidity, drainage and wind. The publication is enriched by photographs, diagrams and charts.

The forest is sectioned into four horizontal habitat zones, each having its characteristic micro-climate. Every living organism in the forest occupies a habitat and maintains a particular niche.

The writer stresses the relationship of habitat and niche requirements by illustrating a classical laboratory experiment wherein *Paramecium aurelia* and *P. caudatum* compete for food while occupying the same habitat and having the same niche requirements. Results show that *P. caudatum* is excluded by competition while *P. aurelia* maintains a stable maximum population level. However, when *P. caudatum* and *P. bursaria* occupy the same habitat but have different niche requirements, both populations became stable and maximum. In the Manitoba forests, five thrush species can live harmoniously and maintain stable populations in the same habitat if stratified, because their niche requirements vary.

The concept of succession is introduced. Factors which limit or reverse this process such as fire, lumbering, agriculture, radiation, insect infestations and disease are discussed.

The writer points out that the Manitoba government is active in research, protection and conservation of its forest resources.

Many terms, concepts and themes basic to ecology are emphasized in this booklet. Numerous activities and projects could be developed from the material presented — for example, development of a food web showing dynamic inter-relationships of the forest's plants and animals. This publication is a good reference for the general public, as well as for students and teachers involved in elementary and high school life science programs. —*Mary A. L. Brown*, Regina.

Letters and Notes

POISON BAIT STATIONS

A notice dated December 2, 1971, in the Hudson Bay paper warns residents to take precautions with their animals because 1080 Poison Bait Stations have been placed in eight different quarter sections in LID #944.

I used to live in the Hudson Bay area and remember when these animals were not harassed by man and snowmobiles. I and my family, although we own skidoos, see *no* sport in running down animals.

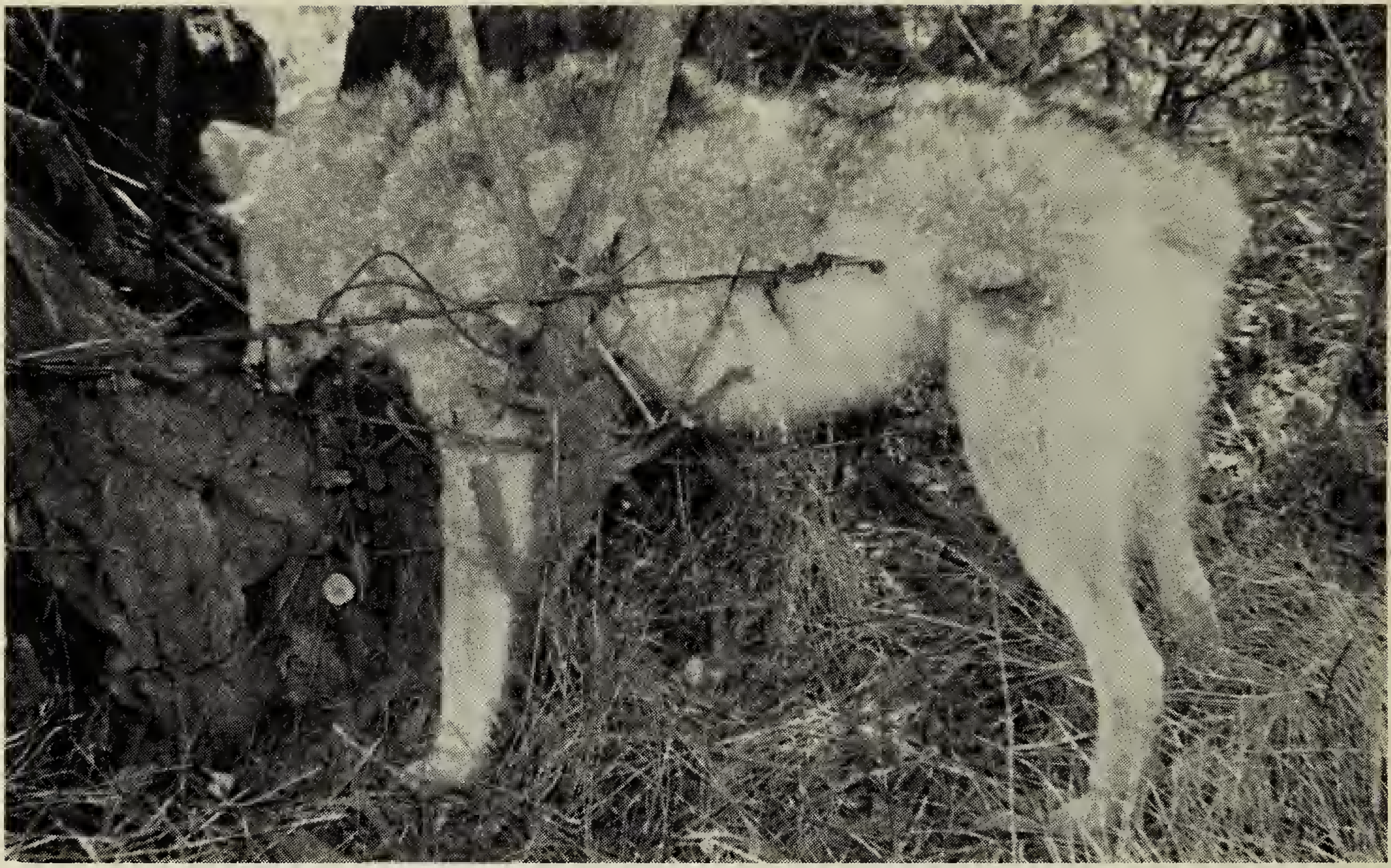
What worries me about the placing of poison bait is the fact that eagles, hawks, and owls are endangered. Domestic animals that can be replaced are surely not so important as a bald or golden eagle.

Can something be done soon? — (Mrs.) *Jean Harris*, Kindersley.

A WINTER PRAIRIE FALCON

While walking along No. 39 highway just south of Weyburn, Saskatchewan, on December 14, 1971, my companion, Roger Barlow, noticed a large "hawk" flying towards us in a northeasterly path. Though I had no binoculars with me at the time, the bird, which was a falcon, approached closely enough for us to note its large size, pale coloration, and black axillars, which clinched its identification as a Prairie Falcon. Its flight was strong, rapid, and fairly close to the ground. The bird was flying towards some grain elevators at the south end of the city, where we lost sight of it. The sighting was made at about 4:00 p.m. with overcast skies.—*Robert Kreba*, 144 Milne St., Regina.

HOW IN THE WORLD?



Here is the picture of a dead coyote that I took in April, 1971. It is a real mystery to me and to others how the animal got into this position. You will note that just behind the front legs the body is firmly wedged between a branch and the main trunk of the tree. There was no evidence of its having made any kind of movement or struggle to free itself from the position. There was a very small trace of blood from the animal's nose but from all appearances it died instantly. —*Sam Alberts*, Brooks, Alberta.

Editor's Note: In the next issue we shall include Mr. Alberts' speculation on how the coyote died along with explanations suggested by readers of the *Blue Jay.*

OUR WILDLIFE

I live at Moosomin, Saskatchewan but I have a farm too. It is located at the edge of the Porcupine Forest. Our farm is just crawling with wild life and some of the animals have become tame. We have had experiences with bush rabbits, woodchucks, mice, deer and even bears.

There are also many beavers and muskrats at our farm. One day when my second cousin and I were walking down the road we saw two muskrats swimming and working busily at a pond. And if you go out to one of our many beaver dams you can sit and watch the beavers working, if you're quiet enough.

One day when my brother and I were walking we saw two big dogs which we claimed were wolves. There are also coyotes and foxes at our farm.

There are all sorts of rodents at our farm. One is a cute little red squirrel which we call Chee-Chee because each morning he peeps out of his hole in the granary and scolds either our dog, our cat or us with a sharp "Chee" sound.

We have seen some real close-ups of birds. I, myself, have seen a humming bird (ruby-throated), bluebird, millions of ruffed grouse and a great blue heron. I was thrilled last summer when my mother and I saw a hawk preying on a rabbit. He dived, he bit, he rose and he hovered repeatedly for about a half hour. It was really interesting. Last summer I had another interesting experience while with my dad. We were walking on the edge of a field when dad and I said in near unison "I could swear that is a Canada Goose I hear." And it was. There were two Canada geese scolding us for something.

We have also, many different types of plants. The grounds are covered with birch, tamarack, spruce and willow. In the grassy meadow and in the brush you find sprinkled blotches of lilies, lady slippers, blue bells, harebells, violets, buttercups, golden rod, strawberry blossoms, fleabane, daisies, asters and many unidentified kinds. Not only are there flowers, trees, grasses, and mosses but also many, many types of mushrooms. We have eaten redcaps, puffballs, oyster mushroom and morels, and we have studied many other kinds.

Like I said, our farm is just crawling with wildlife.—*Roberta Smith* (age 13), Moosomin.

REFLECTIONS ON RUTS

A rut, unlike a rose, is not a rut, is not a rut. On a scale of values of 20th century civilized man ruts may range from "bad" (–10) to "good" (+10) depending on location, mode of origin, and age.

Ruts in the Arctic made recently by motor vehicles are so low on the scale that they do not even merit a non-emotional description. They are called "scars on a fragile environment" (Muir, 1971. *Blue Jay*, 29:172-178). That would hardly be a set of terms suitable for the tracks made by Parry's cart in 1820 when he crossed Melville Island, although some cite the persistence of part of the ruts as evidence for the fragility of the Arctic. However, it is not likely that the words "scars on a fragile environment" will appear on historical markers if and when these will be placed next to Parry's cart trail. Neither is it likely to see these words used as the caption to a photograph showing the multitude of trails trampled by migrating caribou, a natural destruction of the environment that does not lend itself readily to evaluation in human terms. It is something accepted uncritically, as an "Act of God."

Historical markers in Saskatchewan call the traveller's attention to trails used by horses and ruts made by Red River carts (Figure 1). With the help of such high-class advertising the ruts became "good" (10+). They attain this exalted status on account of their (for Saskatchewan) respectable age, the fact that they were made by beast-

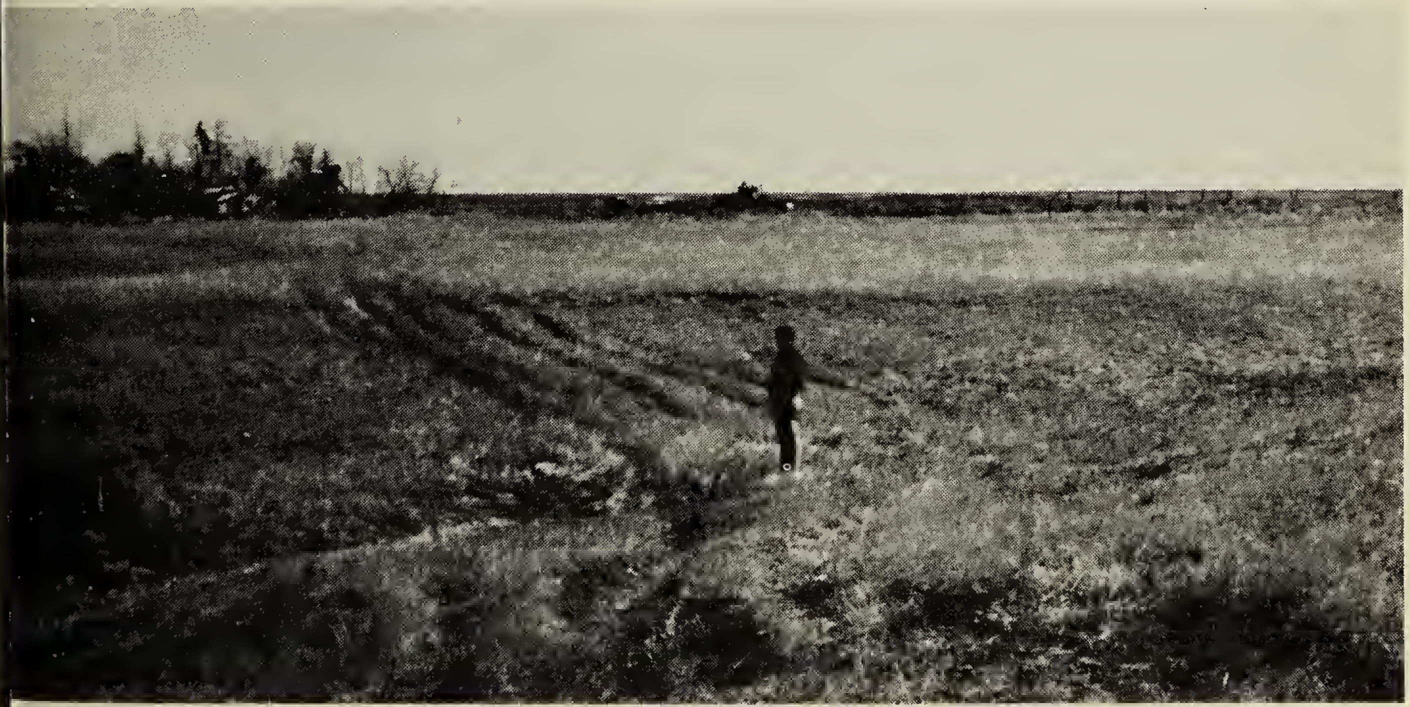


Fig. 1 Ruts. The first sentence on a Saskatchewan Historic Site marker west of the site shown in the above photograph in SW ¼, Sec. 14, T. 1, R 6 W. 2, reads in part: "Along the edge of the coulee . . . the ruts of the Boundary Commission trail are still visible."

drawn, hand-fashioned (remember: no nails!) vehicles, and their location mainly in Palliser's Triangle which even John Macoun did not regard as exceptionally fragile. That "on some of the more commonly used routes . . . as many as twenty parallel ruts marked the course" (Alcock, 1947. A century in the history of the Geological Survey of Canada. Nat. Mus. of Canada. Spec. Contrib. 94 pp.) and that in places the damage thus done is still visible and substantial (Fig. 1) somehow does not put Saskatchewan's historical ruts in the "bad" category.

Undoubtedly the reader is as confused about the above as the author. But then, possibly conservationists and historians use different value systems leaving the common man right in the middle of a rutty problem.—*W. O. Kupsch*, Saskatoon.

SNOWMOBILES

On Saturday, January 22, in the morning, I noticed a snowmobile on my dad's land. Then I saw three more snowmobiles come from behind a hill and converge on our neighbor's land. At that instant I saw a fox running on the open land. Soon the two drivers had the fox trapped and the third driver came in and killed the animal. Since I was a half mile away from the action, I couldn't clearly see whether the fox was stabbed or shot, but I didn't see anybody in a shooting position. I have heard people talking of similar situations, and the fox population around here is pretty low. — *Richard Loewen*, Dalmeny.

RABIES IN BATS

Most of us are aware of the role that skunks, foxes, and coyotes play in carrying and transmitting the rabies virus. We tend to neglect the fact that *bats* can also carry the infection.

According to Dr. W. G. Davidson, of the Department of Public Health, two persons were bitten by rabid bats in this province in 1970. These instances are rare, but they point out the importance of regarding all bat bites as potential exposure to rabies. Medical attention should be sought immediately. Where possible, the bat should be retained for examination by the Department of Public Health.

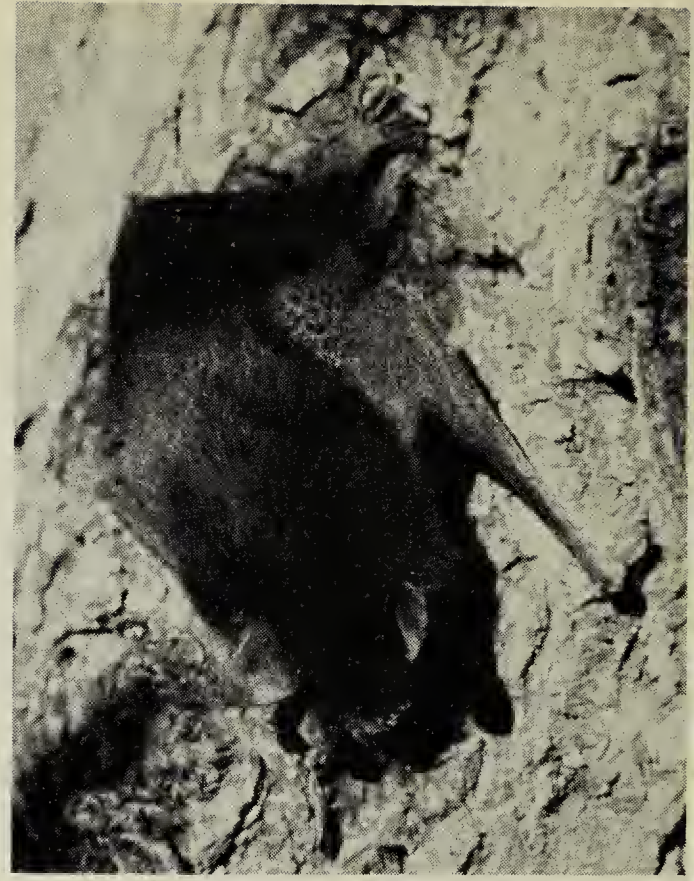


Photo by R. J. Long

Big Brown Bat

It may be significant that both cases in this province involved bats that entered human habitation. It is not unusual for bats to do this while seeking a roost or hibernaculum, but they should be treated with caution. This is especially true if they exhibit unusual behaviour, such as daytime flying.—*Robert J. Long*, Museum, Regina.

LARK SPARROWS AT BULYEA

Several years ago we discovered a pair of Lark Sparrows nesting under one of the evergreens in our spruce grove. Every year since then we have been greeted each spring with their cheerful chirps and musical song while they raised their families.

In 1971 three pairs nested on the ground under spruce boughs and close to the trunk, each about 50 feet apart. They are friendly birds and often would sit on a branch preening themselves 4 to 5 feet from us while we were working in the garden. The young all hatched at about the same time. And then overnight the nests were robbed, leaving two nests empty and a dead fledgling in the third. However, it did not take the Lark Sparrows long to start building again. This time they built in the branches about two feet above the ground, a useful precaution.

At about the time our Agriculture Representative gave us a warning over the air to check evergreens for sawfly infestation, we discovered that one of the trees with a Lark Sparrow nesting in it was badly infested. To preserve the tree we had to spray it, but saving the female bird and her eggs was our first concern. This was solved by keeping the bird off the nest and covering the nest with Saran wrap while the tree was sprayed. Afterwards, the female Lark Sparrow returned to her nest; she continued brooding until the eggs hatched and she eventually raised her family, without any interruption from marauders.—*Mrs. Vern Nordal,* Bulyea, Saskatchewan.

PINE GROSBEAK AFFECTED BY OIL SPILL

The University of Saskatchewan, Saskatoon, had a small oil spill on Friday, October 15, 1971. The oil ran from the sewer system, down a stream

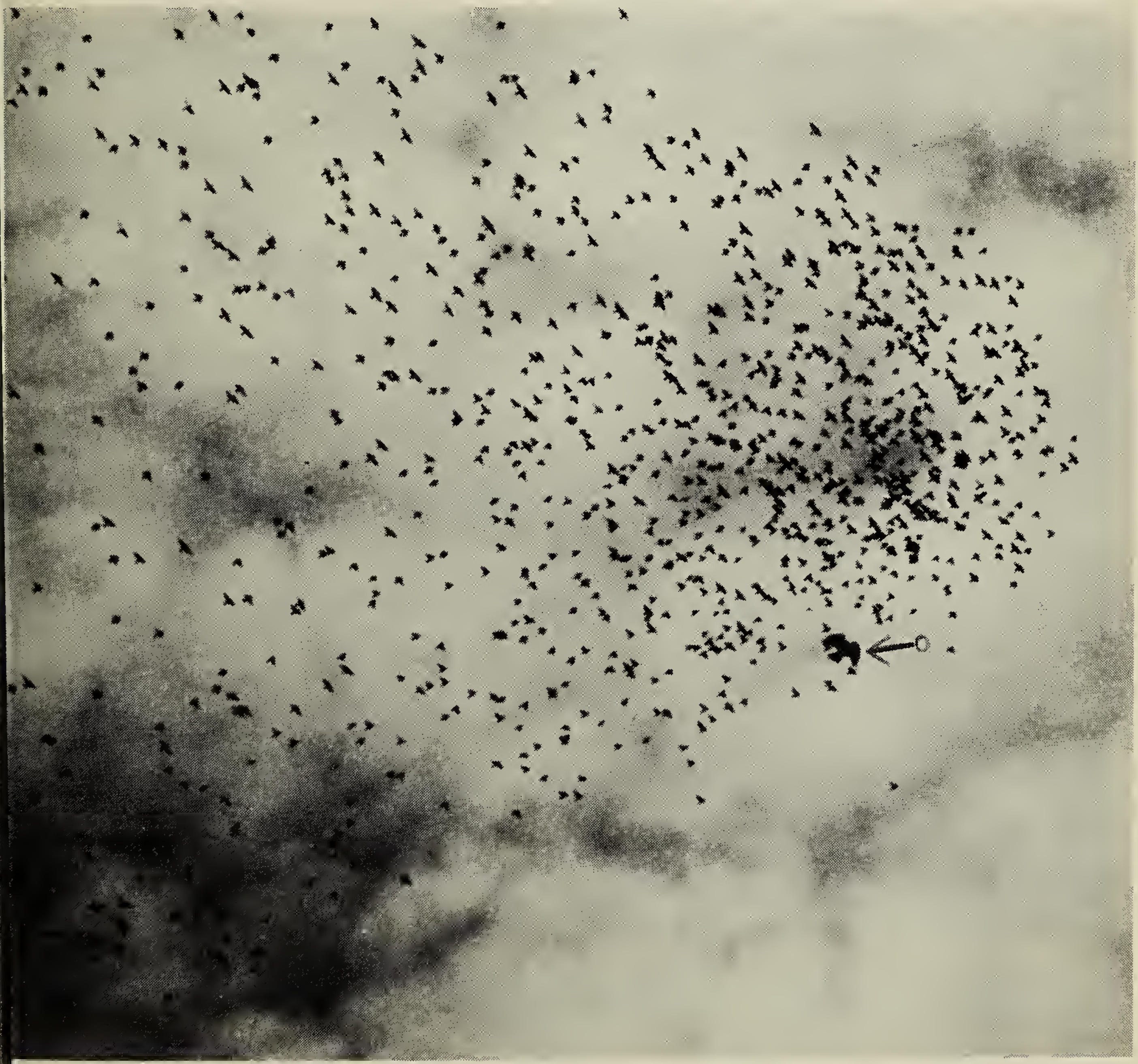


Photo by Al Grass, Burnaby, B.C.

Red-tailed Hawk in Fraser Valley, B.C., mobbed by about 500 blackbirds and starlings.

in a small wooded ravine and into the river. The oil coated everything it touched in the ravine and floating logs, willows, and parts of the shoreline of the South Saskatchewan River for a few hundred yards downstream.

When I visited the area on October 23, a straw dam had been built at the mouth of the ravine. Oil built up behind it and was over an inch thick on the water.

This spill was not a major one. Yet, on October 22, John Mullie and I found a male Pine Grosbeak in this ravine, unable to fly apparently as the result of oil on its wings. I brought the bird to Dr. Stuart Houston who kept it for several days after which it had regained some of its flying ability and was released. Apparently the bird only needed an opportunity to allow the oil in its feathers to dry and to preen some of it off.

This is not significant except in so far as songbirds are not generally thought of as being affected by oil spills. I checked Biological Abstracts for the last ten years but could find only one reference to songbirds which had been affected by an oil spill. In this case the deaths of the songbirds were believed due to a severe storm rather than to the actual spill. Finding a Pine Grosbeak affected by this oil spill (I watched a flock of Pine Grosbeaks in the same place and saw them bathe in oily water, perch on oily branches, and hop over oily rocks and soil), has convinced me that water and shore birds are not the only species to suffer from oil spills. Although it is doubtful that this occurrence is as common among songbirds as among water and shore birds, it is obvious that songbirds are also sometimes affected by oil spills.—*Dale Hjertaas*, Saskatoon.

ARTIFACT DEPOSITORY

The Institute of Northern Studies and the Departments of Anthropology and Geology are collecting, storing, cataloguing and identifying various materials used by Indians in Saskatchewan and adjacent areas. If you wish to know more of the project write to Garry Adams, General Purpose Building, University, Saskatoon.

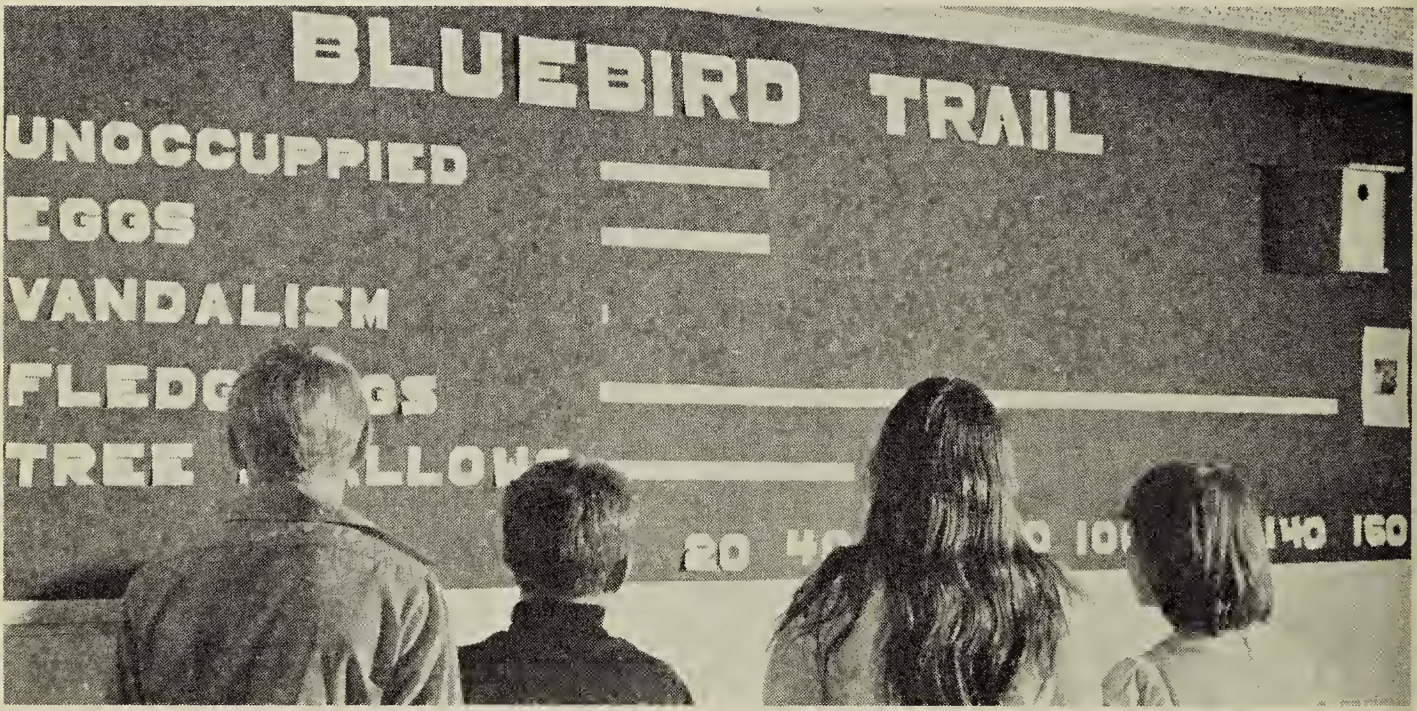


Photo by Gary W. Seib

Brian Mantai, Allen Genereux, Verna French and Judy Genereux, students of Glen Elm School, Regina, consider the results of their 1971 Bluebird Trail. Sylvia Heinek (Grade 6) wrote to the *Blue Jay* to tell how the students of Glen Elm with advice from Lorne Scott built 84 bird houses and set them out, two every mile, along Dewdney Avenue and #1 Highway west. In the June check 30 houses were unoccupied and three were vandalized but in the remaining houses there were 30 eggs and 140 fledgling Tree Swallows.

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